Vol. 1146 Number 3

OFFICIAL GAZETTE

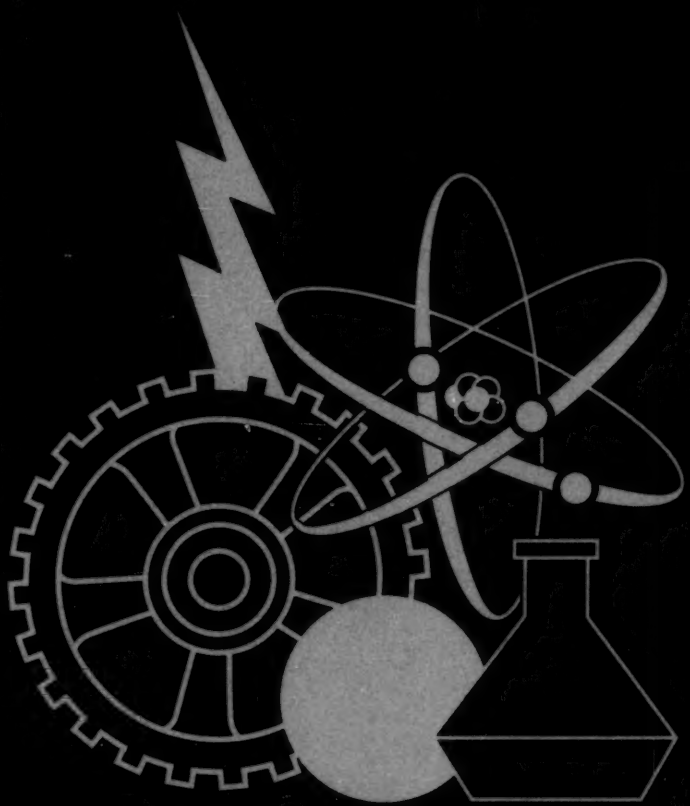
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

oute to:

PATENTS

January 19, 1993



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

January 19, 1993 Volume 1146 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1142 O.G. 66, on Sept. 29, 1992.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on Oct. 1, 1992, due to changes both in the amount of the international search fee charged by the European Patent Office and in the exchange rate of the U.S. dollar to the German mark, and was announced in the *Official Gazette* at 1142 O.G. 20, on Sept. 8, 1992.

International fees, effective on Dec. 1, 1992, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, were announced in the *Official Gazette* at 1143 O.G. 62, on Oct. 27, 1992.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Oct. 1, 1992 and were announced in the *Official Gazette* at 1141 O.G. 68 on Aug. 25, 1992.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	200.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	620.00
—Corresponding prior U.S. national application filed	410.00
—Supplemental search fee, per additional invention	170.00
European Patent Office as ISA	1635.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	450.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	670.00
—Additional examination fee, per additional invention	230.00
International fees	
Basic fee	593.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region for the first 10 national or regional offices	144.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	181.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	320.00	640.00
USPTO was ISA but not IPEA	355.00	710.00
USPTO was neither ISA nor IPEA	475.00	950.00
Filing with an EPO or JPO search report	415.00	830.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	37.00	74.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	115.00	230.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Nov. 8, 1992

DOUGLAS B. COMER,
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on January 16, 1990 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,893,355 through 4,894,864
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 14, 1986 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,564,776 through 4,564,955
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1992, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9f) $465.00
By other than a small entity $930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9f) $935.00
By other than a small entity $1,870.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§ 1.9(f)) $1,410.00
By other than a small entity $2,820.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§ 1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been

(1) unavoidable $620.00
(2) unintentional $1,500.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 8, 1992 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 31,948	06/692,500	7/16/85
(4,480,997)	(06/568,082)	(11/06/84)
4,480,339	06/444,849	11/06/84
4,480,344	06/478,028	11/06/84
4,480,348	06/477,729	11/06/84
4,480,349	06/544,797	11/06/84
4,480,355	06/409,289	11/06/84
4,480,357	06/396,154	11/06/84
4,480,362	06/337,395	11/06/84
4,480,365	06/454,686	11/06/84
4,480,367	06/364,981	11/06/84
4,480,394	06/479,907	11/06/84
4,480,398	06/532,788	11/06/84
4,480,399	06/491,606	11/06/84
4,480,408	06/486,302	11/06/84
4,480,411	06/324,129	11/06/84
4,480,419	06/392,317	11/06/84
4,480,424	06/319,642	11/06/84
4,480,426	06/340,625	11/06/84
4,480,427	06/493,624	11/06/84
4,480,434	06/430,512	11/06/84
4,480,439	06/335,336	11/06/84
4,480,444	06/497,342	11/06/84
4,480,448	06/473,041	11/06/84
4,480,450	06/523,140	11/06/84
4,480,453	06/559,975	11/06/84
4,480,462	06/436,619	11/06/84
4,480,465	06/518,004	11/06/84
4,480,467	06/444,999	11/06/84
4,480,468	06/395,017	11/06/84
4,480,469	06/436,354	11/06/84
4,480,472	06/406,873	11/06/84
4,480,476	06/463,131	11/06/84
4,480,479	06/452,933	11/06/84
4,480,480	06/371,802	11/06/84
4,480,482	06/454,323	11/06/84
4,480,483	06/482,736	11/06/84
4,480,485	06/432,353	11/06/84
4,480,487	06/492,049	11/06/84
4,480,490	06/435,490	11/06/84
4,480,493	06/350,384	11/06/84
4,480,502	06/300,750	11/06/84
4,480,503	06/225,428	11/06/84
4,480,506	06/311,504	11/06/84
4,480,507	06/350,768	11/06/84
4,480,508	06/369,113	11/06/84
4,480,510	06/306,089	11/06/84
4,480,516	06/322,433	11/06/84
4,480,517	06/397,694	11/06/84
4,480,521	06/404,895	11/06/84
4,480,531	06/322,826	11/06/84
4,480,536	06/555,649	11/06/84
4,480,537	06/516,974	11/06/84
4,480,544	06/465,498	11/06/84
4,480,552	06/422,398	11/06/84
4,480,554	06/394,174	11/06/84
4,480,562	06/456,474	11/06/84
4,480,568	06/472,142	11/06/84
4,480,569	06/457,470	11/06/84
4,480,575	06/391,026	11/06/84
4,480,577	06/416,928	11/06/84
4,480,580	06/460,744	11/06/84
4,480,582	06/484,482	11/06/84
4,480,586	06/417,572	11/06/84
4,480,588	06/520,833	11/06/84
4,480,590	06/305,646	11/06/84
4,480,592	06/445,450	11/06/84
4,480,600	06/381,075	11/06/84
4,480,601	06/563,932	11/06/84
4,480,602	06/506,533	11/06/84
4,480,603	06/350,068	11/06/84
4,480,604	06/438,626	11/06/84
4,480,606	06/433,902	11/06/84
4,480,609	06/313,304	11/06/84
4,480,610	06/576,662	11/06/84
4,480,612	06/403,739	11/06/84
4,480,613	06/516,183	11/06/84
4,480,618	06/436,943	11/06/84
4,480,621	06/594,443	11/06/84
4,480,625	06/421,302	11/06/84
4,480,628	06/448,975	11/06/84
4,480,631	06/439,304	11/06/84
4,480,632	06/363,451	11/06/84
4,480,639	06/423,659	11/06/84
4,480,643	06/398,072	11/06/84
4,480,654	06/411,913	11/06/84

Patent Number	Serial Number	Issue Date
4,480,658	06/418,603	11/06/84
4,480,659	06/508,003	11/06/84
4,480,663	06/417,300	11/06/84
4,480,666	06/484,145	11/06/84
4,480,676	06/532,495	11/06/84
4,480,679	06/299,028	11/06/84
4,480,687	06/468,929	11/06/84
4,480,689	06/446,900	11/06/84
4,480,691	06/427,134	11/06/84
4,480,692	06/437,084	11/06/84
4,480,698	06/490,855	11/06/84
4,480,701	06/415,868	11/06/84
4,480,702	06/508,767	11/06/84
4,480,705	06/405,641	11/06/84
4,480,706	06/428,817	11/06/84
4,480,707	06/438,902	11/06/84
4,480,709	06/377,463	11/06/84
4,480,712	06/254,269	11/06/84
4,480,713	06/442,233	11/06/84
4,480,715	06/428,729	11/06/84
4,480,716	06/500,977	11/06/84
4,480,720	06/437,862	11/06/84
4,480,724	06/468,148	11/06/84
4,480,732	06/301,063	11/06/84
4,480,733	06/260,483	11/06/84
4,480,735	06/423,616	11/06/84
4,480,740	06/396,905	11/06/84
4,480,744	06/447,707	11/06/84
4,480,747	06/509,475	11/06/84
4,480,755	06/417,600	11/06/84
4,480,758	06/438,581	11/06/84
4,480,763	06/431,820	11/06/84
4,480,764	06/466,292	11/06/84
4,480,765	06/449,351	11/06/84
4,480,766	06/422,392	11/06/84
4,480,769	06/388,410	11/06/84
4,480,770	06/294,323	11/06/84
4,480,775	06/431,244	11/06/84
4,480,778	06/415,576	11/06/84
4,480,782	06/454,676	11/06/84
4,480,783	06/528,820	11/06/84
4,480,787	06/420,063	11/06/84
4,480,789	06/506,585	11/06/84
4,480,791	06/392,008	11/06/84
4,480,798	06/541,187	11/06/84
4,480,801	06/377,607	11/06/84
4,480,804	06/348,182	11/06/84
4,480,807	06/417,175	11/06/84
4,480,816	06/376,936	11/06/84
4,480,820	06/451,143	11/06/84
4,480,826	06/396,481	11/06/84
4,480,831	06/357,584	11/06/84
4,480,833	06/366,342	11/06/84
4,480,834	06/433,031	11/06/84
4,480,842	06/507,863	11/06/84
4,480,846	06/486,568	11/06/84
4,480,847	06/417,348	11/06/84
4,480,848	06/490,781	11/06/84
4,480,849	06/410,660	11/06/84
4,480,850	06/420,829	11/06/84
4,480,853	06/429,119	11/06/84
4,480,856	06/425,421	11/06/84
4,480,862	06/325,238	11/06/84
4,480,864	06/376,969	11/06/84
4,480,865	06/359,170	11/06/84
4,480,870	06/310,494	11/06/84
4,480,874	06/302,800	11/06/84
4,480,875	06/396,505	11/06/84
4,480,876	06/387,549	11/06/84
4,480,885	06/467,002	11/06/84
4,480,887	06/388,212	11/06/84
4,480,890	06/311,034	11/06/84
4,480,893	06/257,734	11/06/84
4,480,895	06/324,567	11/06/84
4,480,899	06/309,650	11/06/84
4,480,900	06/503,003	11/06/84
4,480,907	06/460,612	11/06/84
4,480,912	06/351,960	11/06/84
4,480,916	06/395,769	11/06/84
4,480,918	06/354,807	11/06/84
4,480,920	06/519,216	11/06/84
4,480,922	06/437,501	11/06/84
4,480,929	06/410,970	11/06/84
4,480,931	06/356,382	11/06/84
4,480,934	06/451,683	11/06/84
4,480,936	06/460,247	11/06/84
4,480,942	06/411,451	11/06/84
4,480,943	06/397,197	11/06/84
4,480,948	06/400,209	11/06/84
4,480,957	06/484,882	11/06/84
4,480,970	06/383,191	11/06/84
4,480,975	06/452,669	11/06/84
4,480,976	06/471,146	11/06/84
4,480,985	06/352,331	11/06/84
4,481,000	06/373,305	11/06/84
4,481,011	06/431,215	11/06/84
4,481,024	06/436,183	11/06/84
4,481,025	06/426,615	11/06/84
4,481,026	06/541,504	11/06/84
4,481,034	06/417,671	11/06/84
4,481,035	06/526,374	11/06/84
4,481,038	06/509,018	11/06/84
4,481,039	06/293,283	11/06/84
4,481,043	06/447,727	11/06/84
4,481,058	06/413,186	11/06/84
4,481,059	06/456,591	11/06/84
4,481,066	06/585,138	11/06/84
4,481,069	06/337,231	11/06/84
4,481,071	06/566,871	11/06/84
4,481,072	06/410,162	11/06/84
4,481,080	06/494,236	11/06/84
4,481,083	06/528,184	11/06/84
4,481,084	06/600,239	11/06/84
4,481,088	06/395,753	11/06/84
4,481,091	06/544,396	11/06/84
4,481,094	06/548,042	11/06/84
4,481,098	06/493,628	11/06/84
4,481,100	06/518,576	11/06/84
4,481,104	06/579,286	11/06/84
4,481,108	06/445,052	11/06/84
4,481,110	06/484,654	11/06/84
4,481,114	06/493,146	11/06/84
4,481,119	06/474,414	11/06/84
4,481,120	06/490,625	11/06/84
4,481,126	06/401,578	11/06/84
4,481,128	06/356,687	11/06/84
4,481,129	06/446,103	11/06/84
4,481,132	06/395,294	11/06/84
4,481,134	06/343,803	11/06/84
4,481,142	06/437,047	11/06/84
4,481,147	06/512,322	11/06/84
4,481,149	06/477,899	11/06/84
4,481,152	06/447,224	11/06/84
4,481,153	06/447,111	11/06/84
4,481,159	06/456,430	11/06/84
4,481,161	06/458,289	11/06/84
4,481,164	06/358,962	11/06/84
4,481,167	06/279,416	11/06/84
4,481,173	06/443,497	11/06/84
4,481,174	06/477,874	11/06/84
4,481,178	06/439,784	11/06/84
4,481,179	06/541,196	11/06/84
4,481,180	06/464,784	11/06/84
4,481,181	06/537,299	11/06/84
4,481,182	06/566,192	11/06/84
4,481,183	06/566,193	11/06/84
4,481,184	06/465,957	11/06/84
4,481,191	06/480,691	11/06/84
4,481,193	06/586,933	11/06/84
4,481,194	06/586,934	11/06/84
4,481,196	06/528,062	11/06/84
4,481,199	06/511,234	11/06/84
4,481,201	06/318,973	11/06/84
4,481,204	06/509,150	11/06/84
4,481,206	06/505,717	11/06/84
4,481,207	06/523,349	11/06/84

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4,481,217	06/269,930	11/06/84
4,481,221	06/531,999	11/06/84
4,481,222	06/536,075	11/06/84
4,481,224	06/521,321	11/06/84
4,481,235	06/531,678	11/06/84
4,481,242	06/402,859	11/06/84
4,481,250	06/518,515	11/06/84
4,481,263	06/535,122	11/06/84
4,481,266	06/478,695	11/06/84
4,481,269	06/497,603	11/06/84
4,481,270	06/489,405	11/06/84
4,481,271	06/330,548	11/06/84
4,481,277	06/463,075	11/06/84
4,481,301	06/444,152	11/06/84
4,481,302	06/461,318	11/06/84
4,481,310	06/503,081	11/06/84
4,481,316	06/452,266	11/06/84
4,481,321	06/516,047	11/06/84
4,481,326	06/517,486	11/06/84
4,481,327	06/454,292	11/06/84
4,481,333	06/566,207	11/06/84
4,481,338	06/528,171	11/06/84
4,481,339	06/532,326	11/06/84
4,481,340	06/460,415	11/06/84
4,481,353	06/539,978	11/06/84
4,481,354	06/451,194	11/06/84
4,481,363	06/461,942	11/06/84
4,481,372	06/430,941	11/06/84
4,481,377	06/525,518	11/06/84
4,481,380	06/411,704	11/06/84
4,481,385	06/374,122	11/06/84
4,481,389	06/404,615	11/06/84
4,481,392	06/349,964	11/06/84
4,481,400	06/456,050	11/06/84
4,481,404	06/452,223	11/06/84
4,481,408	06/549,088	11/06/84
4,481,409	06/438,770	11/06/84
4,481,416	06/450,875	11/06/84
4,481,419	06/316,415	11/06/84
4,481,421	06/381,099	11/06/84
4,481,423	06/329,159	11/06/84
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4,481,438	06/417,657	11/06/84
4,481,439	06/454,130	11/06/84
4,481,441	06/351,574	11/06/84
4,481,450	06/480,127	11/06/84
4,481,459	06/563,449	11/06/84
4,481,473	06/321,146	11/06/84
4,481,475	06/405,465	11/06/84
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4,481,491	06/456,136	11/06/84
4,481,502	06/362,554	11/06/84
4,481,503	06/403,281	11/06/84
4,481,510	06/333,408	11/06/84
4,481,513	06/377,311	11/06/84
4,481,515	06/364,296	11/06/84
4,481,516	06/428,196	11/06/84
4,481,517	06/261,415	11/06/84
4,481,525	06/407,348	11/06/84
4,481,527	06/489,461	11/06/84
4,481,528	06/451,364	11/06/84
4,481,529	06/382,736	11/06/84
4,481,530	06/380,014	11/06/84
4,481,540	06/381,086	11/06/84
4,481,542	06/359,605	11/06/84
4,481,549	06/219,048	11/06/84
4,481,552	06/315,792	11/06/84
4,481,558	06/428,287	11/06/84
4,481,560	06/402,892	11/06/84
4,481,564	06/416,201	11/06/84
4,481,565	06/396,282	11/06/84
4,481,568	06/313,614	11/06/84
4,481,570	06/291,645	11/06/84
4,481,576	06/359,643	11/06/84
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4,481,581	06/470,249	11/06/84
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4,481,627	06/316,720	11/06/84
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4,481,634	06/489,512	11/06/84
4,481,641	06/429,418	11/06/84
4,481,653	06/407,287	11/06/84
4,481,656	06/374,805	11/06/84
4,481,660	06/443,008	11/06/84
4,481,661	06/420,846	11/06/84
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4,481,668	06/492,338	11/06/84
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4,782,635	07/075,085	11/08/88
4,782,637	07/032,342	11/08/88
4,782,641	07/002,353	11/08/88
4,782,649	07/036,439	11/08/88
4,782,663	06/852,230	11/08/88
4,782,666	07/096,882	11/08/88
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4,782,681	07/077,838	11/08/88
4,782,688	07/087,063	11/08/88
4,782,690	06/886,067	11/08/88
4,782,696	07/023,097	11/08/88
4,782,698	06/947,297	11/08/88
4,782,704	06/942,238	11/08/88
4,782,708	07/090,012	11/08/88
4,782,716	06/434,792	11/08/88
4,782,722	06/886,202	11/08/88
4,782,725	07/083,700	11/08/88
4,782,729	07/095,105	11/08/88
4,782,737	06/845,635	11/08/88
4,782,738	06/777,232	11/08/88
4,782,745	06/599,920	11/08/88
4,782,748	07/123,307	11/08/88
4,782,751	07/039,606	11/08/88
4,782,754	06/941,862	11/08/88
4,782,765	07/113,754	11/08/88
4,782,772	07/108,723	11/08/88

Patent Number	Serial Number	Issue Date
4,782,774	07/035,410	11/08/88
4,782,776	07/049,105	11/08/88
4,782,777	06/936,378	11/08/88
4,782,779	07/004,760	11/08/88
4,782,780	07/061,344	11/08/88
4,782,782	07/112,370	11/08/88
4,782,783	06/829,439	11/08/88
4,782,788	07/115,629	11/08/88
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4,782,792	06/882,404	11/08/88
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4,782,812	07/054,385	11/08/88
4,782,813	07/075,548	11/08/88
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4,782,818	06/914,896	11/08/88
4,782,821	07/057,315	11/08/88
4,782,827	06/804,859	11/08/88
4,782,843	07/049,945	11/08/88
4,782,844	07/031,360	11/08/88
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4,782,917	07/167,361	11/08/88
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4,782,945	07/062,060	11/08/88
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4,782,978	07/092,761	11/08/88
4,782,981	07/100,724	11/08/88
4,782,984	07/107,096	11/08/88
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4,783,070	07/006,388	11/08/88
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4,783,116	07/043,103	11/08/88
4,783,118	07/017,492	11/08/88
4,783,129	07/001,074	11/08/88
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4,783,137	06/757,987	11/08/88
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4,783,167	07/046,906	11/08/88
4,783,168	07/039,864	11/08/88
4,783,171	06/866,274	11/08/88
4,783,172	07/130,425	11/08/88
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4,783,233	06/941,584	11/08/88
4,783,234	06/941,719	11/08/88
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4,783,250	07/013,691	11/08/88
4,783,254	07/022,205	11/08/88
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4,783,319	07/080,212	11/08/88
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4,783,322	06/636,656	11/08/88
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4,783,336	06/772,387	11/08/88
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4,783,354	06/941,398	11/08/88
4,783,359	06/932,180	11/08/88
4,783,379	07/040,455	11/08/88
4,783,386	07/002,345	11/08/88
4,783,406	06/920,754	11/08/88
4,783,411	06/663,322	11/08/88
4,783,413	07/049,436	11/08/88
4,783,414	07/103,667	11/08/88
4,783,418	07/002,931	11/08/88
4,783,419	06/714,453	11/08/88
4,783,436	07/074,061	11/08/88
4,783,443	06/835,280	11/08/88
4,783,456	07/062,129	11/08/88
4,783,458	06/872,685	11/08/88
4,783,459	07/041,706	11/08/88
4,783,464	07/123,016	11/08/88
4,783,470	06/818,712	11/08/88
4,783,474	07/104,710	11/08/88
4,783,476	06/942,109	11/08/88
4,783,482	06/798,034	11/08/88
4,783,497	06/809,260	11/08/88
4,783,511	07/062,350	11/08/88
4,783,527	06/276,462	11/08/88
4,783,528	07/058,774	11/08/88
4,783,529	06/804,218	11/08/88
4,783,536	06/699,273	11/08/88
4,783,537	06/797,590	11/08/88

Patent Number	Serial Number	Issue Date
4,783,541	07/135,504	11/08/88
4,783,550	06/750,552	11/08/88
4,783,553	07/026,297	11/08/88
4,783,555	06/884,411	11/08/88
4,783,558	07/036,968	11/08/88
4,783,562	06/352,494	11/08/88
4,783,564	07/102,291	11/08/88
4,783,569	07/053,796	11/08/88
4,783,570	07/053,797	11/08/88
4,783,582	07/108,121	11/08/88
4,783,584	06/656,870	11/08/88
4,783,593	06/813,385	11/08/88
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4,783,749	06/852,159	11/08/88
4,783,750	06/907,326	11/08/88
4,783,755	06/828,318	11/08/88
4,783,762	07/045,195	11/08/88
4,783,773	07/207,826	11/08/88
4,783,777	06/945,062	11/08/88
4,783,790	07/008,794	11/08/88
4,783,794	06/886,362	11/08/88
4,783,796	06/803,126	11/08/88
4,783,799	07/073,253	11/08/88
4,783,803	06/797,249	11/08/88
4,783,810	07/035,103	11/08/88
4,783,814	06/917,160	11/08/88
4,783,815	07/119,719	11/08/88
4,783,816	06/714,337	11/08/88
4,783,822	06/894,541	11/08/88

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,928,941, Re. S.N. 07/891,168, Filed May 29, 1992, Cl. 270/53, SHEET SORTER WITH STAPLER, Nobutaka Uto, et. al., Owner of Record: *Cannon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Lawrence A. Stahl, Ex. Gp.: 3401

4,951,244, Re. S.N. 07/933,033, Filed Aug. 20, 1992, Cl. 364/723, LINEAR INTERPOLATION OPERATOR, Jacques Meyer, Owner of Record: *SGS-Thomson Microelectronics, Gentilly, France,* Attorney or Agent: Kenneth C. Hill, Ex. Gp.: 2306

4,957,977, Re. S.N. 07/946,530, Filed Sept. 16, 1992, Cl. 525/328.4, VINYLAMINE COPOLYMER, FLOCCULATING AGENT, ETC., Takaharu Itagaki. et. al., Owner of Record: *Mitsubishi Kasei Corp., Tokyo, Japan,* Attorney or Agent: George W. Neuner, Ex. Gp.: 1505

4,978,637, Re. S.N. 07/984,084, Filed Nov. 30, 1992, Cl. 437/193, LOCAL INTERCONNECT PROCESS FOR INTEGRATED CIRCUITS, Fu-Tai Liou, et. al., Owner of Record: *SGS-Thomson Microelectronics, Inc., Carrollton, Tex.,* Attorney or Agent: Kenneth C. Hill, Ex. Gp.: 1104

4,980,299, Re. S.N. 07/984,867, Filed Dec. 1, 1992, Cl. 436/531, CARRIER FOR COATING WITH IMMUNOLOGICALLY-ACTIVE MATERIAL, Hans-Georg Batz, et. al., Owner of Record: *Boehringer Mannheim GmbH, Mannheim, Federal Republic of Germany,* Attorney or Agent: Norman D. Hanson, Ex. Gp.: 1802

5,039,936, Re. S.N. 07/986,978, Filed Dec. 8, 1992, Cl. 324/108, VOLTAGE ROTATION INDICATOR MOUNTING APPARATUS, Robert R. Gonzales, Owner of Record: *Houston Industries Inc., Houston, Tex.,* Attorney or Agent: Albert B. Kimball, Ex. Gp.: 2607

5,149,269, Re. S.N. 07/963,742, Filed Oct. 20, 1992, Cl. 434/203, MANUAL TEACHING CALCULATOR, Howard M. Ylitalo, Owner of Record: *Inventor,* Attorney or Agent: Leo Gregory, Ex. Gp.: 3302

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,051,983, Reexam. No. 90/002,882, Requested Nov. 10, 1992, Cl. 222/321, PUMP SPRAYER, Walter F. Anderson, Owner of Record: *Calmar, Inc., City of Industry, Calif.,* Attorney or Agent: Lawrence R. Radanovic, Watson, Cole, Grindle & Watson, Washington, D.C., Ex. Gp.: 3104, Requester: Kenyon & Kenyon, Washington, D.C.

4,918,454, Reexam. No. 90/002,883, Requested Nov. 10, 1992, Cl. 341/172, COMPENSATED CAPACITORS FOR SWITCHED CAPACITORS INPUT OF ANALOG-TO-DIGITAL CONVERTER, Adrian B. Early, et. al., Owner of Record: *Crystal Semiconductor Corp., Austin, Tex.,* Attorney or Agent: Richard C. Auchterloine, Arnold, White & Durkee, Houston, Tex., Ex. Gp.: 2107, Requester: Owner

4,960,165, Reexam. No. 90/002,899, Requested Dec. 2, 1992, Cl. 164/491, METHOD AND APPARATUS FOR ADJUSTING A MOLD DURING CASTING IN A CONTINUOUS CASTING PROCESS, Helmut Eidinger, et. al., Owner of Record: *Voest-Alpine Industrieanlagenbau Gesellschaft, M. B. H., Linz, Austria,* Attorney or Agent: Georg Seka, Townsend & Townsend, San Francisco, Calif., Ex. Gp.: 3205, Requester: Jerry Weiner, Acutus Industries, Pontiac, Mich.

5,055,238, Reexam. No. 90/002,900, Requested Nov. 25, 1992, Cl. 187/163, DIAPHRAGM CARBURETOR, Satoru Araki, Owner of Record: *Shinagawa Diecast Industrial Corp., Zania, Japan,* Attorney or Agent: Samuel B. Stone, Lyon & Lyon, Los Angeles, Calif., Ex. Gp.: 1305, Requester: Owner

5,098,290, Reexam. No. 90/002,898, Requested Nov. 27, 1992, Cl. 433/074, DENTAL MODELING METHOD AND APPARATUS USING APERTURED METRIX PLATE, Jerry P. Honstein, et. al., Owner of Record: *Jerry P. Honstein, Anaheim Hills, Calif.,* Attorney or Agent: William L. Chapin, Huntington Beach, Calif., Ex. Gp.: 3303, Requester: Michael J. Striker, New York, N.Y.

5,143,325, Reexam. No. 90/002,901, Requested Dec. 7, 1992, Cl. 244/134, ELECTROMAGNETIC REPULSION SYSTEM FOR REMOVING CONTAMINANTS SUCH AS ICE FROM THE SURFACES OF AIRCRAFT AND OTHER OBJECTS, Peter B. Zieve, et. al., Owner of Record: *Electroimpact, Inc., Seattle, Wash.,* Attorney or Agent: Clark A. Puntigen, Graybeal, Jensen & Huntigan, Seattle, Wash., Ex. Gp.: 3105, Requester: Richard A. Romanchik, The B. F. Goodrich Co., Brecksville, Ohio

Notice of Expiration of Trademark Registrations Due to Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED DECEMBER 7, 1992 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
37,901	70/037,901	3/04/1902
37,907	70/028,090	3/04/1902
85,675	71/049,619	3/05/1912
85,691	71/058,977	3/05/1912
85,696	71/046,535	3/05/1912
291,996	71/320,235	3/01/1932
292,000	71/318,831	3/01/1932
292,002	71/319,671	3/01/1932
292,008	71/319,476	3/01/1932
292,018	71/320,132	3/01/1932
292,028	71/320,520	3/01/1932
292,074	71/317,894	3/01/1932
292,076	71/318,273	3/01/1932
292,078	71/318,930	3/01/1932
292,083	71/319,857	3/01/1932
292,101	71/319,823	3/01/1932
292,106	71/319,093	3/01/1932
292,136	71/318,321	3/01/1932
292,142	71/320,634	3/01/1932
292,165	71/309,349	3/01/1932
444,665	71/508,321	3/04/1952
444,667	71/508,325	3/04/1952
444,668	71/508,335	3/04/1952
555,119	71/538,124	3/04/1952
555,534	71/512,472	3/04/1952
555,537	71/524,878	3/04/1952
555,539	71/527,788	3/04/1952
555,544	71/539,184	3/04/1952
555,546	71/543,896	3/04/1952
555,552	71/557,902	3/04/1952
555,567	71/569,240	3/04/1952
555,573	71/572,955	3/04/1952
555,574	71/573,002	3/04/1952
555,575	71/573,004	3/04/1952
555,576	71/573,823	3/04/1952
555,578	71/575,280	3/04/1952
555,586	71/580,173	3/04/1952
555,591	71/586,248	3/04/1952
555,592	71/586,486	3/04/1952
555,594	71/586,966	3/04/1952
555,604	71/593,397	3/04/1952
555,608	71/601,606	3/04/1952
555,611	71/594,627	3/04/1952
555,613	71/594,631	3/04/1952
555,615	71/595,655	3/04/1952
555,618	71/597,125	3/04/1952
555,638	71/601,708	3/04/1952
555,652	71/604,390	3/04/1952
555,653	71/604,392	3/04/1952
555,654	71/604,765	3/04/1952
555,661	71/606,156	3/04/1952
555,662	71/606,248	3/04/1952
555,669	71/607,381	3/04/1952
555,673	71/608,247	3/04/1952
555,678	71/609,054	3/04/1952
555,683	71/609,545	3/04/1952
555,696	71/611,358	3/04/1952
555,698	71/611,701	3/04/1952
555,699	71/611,890	3/04/1952
555,714	71/613,462	3/04/1952
555,726	71/616,470	3/04/1952
555,728	71/616,577	3/04/1952
555,732	71/618,160	3/04/1952
555,737	71/533,356	3/04/1952
555,747	71/576,617	3/04/1952
555,752	71/585,284	3/04/1952
555,754	71/586,747	3/04/1952
555,760	71/594,739	3/04/1952
921,851	72/308,647	10/12/1971
929,834	72/348,805	2/29/1972
929,837	72/375,688	2/29/1972
929,838	72/376,375	2/29/1972
929,839	72/378,025	2/29/1972
929,846	72/341,216	2/29/1972
929,848	72/352,489	2/29/1972
929,850	72/362,971	2/29/1972
929,851	72/369,151	2/29/1972
929,853	72/374,638	2/29/1972
929,855	72/379,064	2/29/1972
929,859	72/296,770	2/29/1972
929,863	72/381,239	2/29/1972
929,865	72/381,244	2/29/1972
929,866	72/381,245	2/29/1972
929,869	72/356,954	2/29/1972
929,875	72/380,059	2/29/1972
929,879	72/394,630	2/29/1972
929,883	72/397,655	2/29/1972
929,884	72/398,223	2/29/1972
929,887	72/391,284	2/29/1972
929,890	72/351,241	2/29/1972
929,892	72/370,269	2/29/1972
929,896	72/337,782	2/29/1972
929,899	72/367,439	2/29/1972
929,908	72/373,155	2/29/1972
929,910	72/374,875	2/29/1972
929,917	72/379,853	2/29/1972
929,921	72/348,918	2/29/1972
929,922	72/359,411	2/29/1972
929,923	72/364,123	2/29/1972
929,925	72/369,496	2/29/1972
929,927	72/371,541	2/29/1972
929,929	72/373,562	2/29/1972
929,930	72/373,563	2/29/1972
929,933	72/396,841	2/29/1972
929,934	72/362,736	2/29/1972
929,949	72/383,449	2/29/1972
929,950	72/383,450	2/29/1972
929,955	72/386,784	2/29/1972
929,959	72/388,033	2/29/1972
929,962	72/391,138	2/29/1972
929,964	72/392,826	2/29/1972
929,966	72/396,409	2/29/1972
929,968	72/397,418	2/29/1972
929,976	72/346,489	2/29/1972
929,977	72/351,972	2/29/1972
929,979	72/354,384	2/29/1972
929,983	72/372,829	2/29/1972
929,984	72/373,704	2/29/1972
929,996	72/367,602	2/29/1972
929,997	72/370,426	2/29/1972
929,998	72/370,521	2/29/1972
930,000	72/373,695	2/29/1972
930,002	72/375,876	2/29/1972
930,012	72/390,750	2/29/1972
930,015	72/385,456	2/29/1972
930,017	72/391,495	2/29/1972
930,020	72/376,187	2/29/1972
930,021	72/377,619	2/29/1972
930,022	72/377,620	2/29/1972
930,030	72/363,506	2/29/1972
930,031	72/375,983	2/29/1972
930,032	72/348,279	2/29/1972
930,033	72/363,158	2/29/1972
930,035	72/377,295	2/29/1972
930,041	72/371,509	2/29/1972
930,048	72/352,254	2/29/1972
930,051	72/366,839	2/29/1972
930,052	72/370,414	2/29/1972

Reg. Number	Serial Number	Reg. Date
930,054	72/384,955	2/29/1972
930,055	72/393,801	2/29/1972
930,057	72/343,027	2/29/1972
930,058	72/348,055	2/29/1972
930,059	72/349,788	2/29/1972
930,063	72/372,485	2/29/1972
930,064	72/378,133	2/29/1972
930,071	72/357,657	2/29/1972
930,075	72/375,414	2/29/1972
930,076	72/375,568	2/29/1972
930,081	72/392,743	2/29/1972
930,085	72/379,026	2/29/1972
930,089	72/386,191	2/29/1972
930,091	72/397,406	2/29/1972
930,092	72/397,408	2/29/1972
930,094	72/398,257	2/29/1972
930,100	72/398,267	2/29/1972
930,105	72/347,412	2/29/1972
930,106	72/352,638	2/29/1972
930,110	72/361,809	2/29/1972
930,111	72/363,646	2/29/1972
930,112	72/364,043	2/29/1972
930,119	72/373,283	2/29/1972
930,124	72/376,051	2/29/1972
930,126	72/380,095	2/29/1972
930,131	72/392,602	2/29/1972
930,132	72/397,640	2/29/1972
930,134	72/373,545	2/29/1972
930,137	72/347,769	2/29/1972
930,146	72/332,627	2/29/1972
930,147	72/360,281	2/29/1972
930,150	72/398,529	2/29/1972
930,153	72/350,677	2/29/1972
930,154	72/371,938	2/29/1972
930,159	72/282,218	2/29/1972
930,160	72/282,219	2/29/1972
930,168	72/374,717	2/29/1972
930,182	72/351,573	2/29/1972
930,185	72/355,315	2/29/1972
930,189	72/363,254	2/29/1972
930,192	72/366,874	2/29/1972
930,193	72/368,218	2/29/1972
930,197	72/375,294	2/29/1972
930,198	72/383,745	2/29/1972
930,202	72/388,171	2/29/1972
930,204	72/388,855	2/29/1972
930,208	72/336,111	2/29/1972
930,209	72/361,564	2/29/1972
930,211	72/372,189	2/29/1972
930,212	72/373,273	2/29/1972
930,213	72/374,028	2/29/1972
930,214	72/374,029	2/29/1972
930,215	72/375,016	2/29/1972
930,217	72/390,180	2/29/1972
930,222	72/369,083	2/29/1972
930,223	72/369,780	2/29/1972
930,225	72/385,922	2/29/1972
930,226	72/396,528	2/29/1972
930,228	72/369,576	2/29/1972
930,229	72/380,115	2/29/1972
930,231	72/382,688	2/29/1972
930,233	72/391,504	2/29/1972
930,234	72/391,672	2/29/1972
930,235	72/391,673	2/29/1972
930,237	72/330,166	2/29/1972
930,240	72/345,209	2/29/1972
930,242	72/359,863	2/29/1972
930,244	72/312,744	2/29/1972
930,248	72/359,362	2/29/1972
930,250	72/375,546	2/29/1972
930,253	72/356,851	2/29/1972
930,263	72/386,205	2/29/1972
930,264	72/373,330	2/29/1972
930,266	72/366,432	2/29/1972
930,267	72/375,396	2/29/1972
930,268	72/371,668	2/29/1972

Registration to Practice

The following person successfully passed the registration examination that was held Apr. 8, 1992. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before Mar. 5, 1993.

Steinberg, Thomas W., 4084 Camelot Ct., Dumfries, Va. 22202

Dec. 18, 1992

CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the persons seeking registration are of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before Mar. 5, 1993.

Hunt, John C., 610-40 Alexander St., Toronto, Ont., M4Y 1B5, Canada

Pertilla, Theodore E., 6657 13th St., N.W., Washington, D.C. 20012

Sarkis, Marcelo K., 72 Yongehurst Rd., Richmond Hill Ont., L4C 3T2, Canada

Tandan, Susan I., 123 Woodmount Ave., East York, Ont., M4C 3Y7, Canada

Dec. 18, 1992

CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

PATENT NOTICES

Certificates of Correction For Week of January 19, 1993

Des. 313,077	4,974,594	5,018,080	5,043,866
Des. 317,564	4,974,786	5,018,115	5,044,458
Des. 319,119	4,977,315	5,018,156	5,045,181
Des. 319,227	4,977,316	5,018,703	5,045,228
Re. 33,574	4,981,352	5,021,040	5,045,567
4,066,501	4,981,787	5,021,165	5,045,658
4,328,753	4,983,895	5,021,204	5,045,668
4,562,193	4,986,729	5,022,135	5,046,003
4,596,823	4,992,054	5,022,689	5,046,452
4,642,241	4,992,906	5,022,926	5,046,484
4,652,491	4,993,590	5,023,017	5,046,554
4,679,356	4,993,769	5,023,919	5,046,679
4,694,536	4,993,816	5,025,533	5,046,730
4,794,028	4,994,100	5,025,596	5,046,890
4,805,047	4,995,053	5,026,157	5,047,083
4,836,375	4,995,601	5,026,685	5,047,099
4,836,859	4,955,632	5,026,762	5,047,153
4,837,810	4,996,330	5,026,843	5,047,154
4,840,969	4,997,199	5,028,646	5,047,485
4,846,913	4,997,949	5,028,854	5,047,543
4,846,943	4,998,257	5,029,011	5,048,132
4,857,101	4,998,537	5,029,032	5,048,734
4,857,817	4,999,319	5,029,100	5,048,928
4,865,474	4,999,401	5,029,626	5,048,963
4,875,798	5,000,293	5,030,974	5,049,008
4,902,557	5,000,404	5,030,976	5,049,318
4,911,126	5,000,854	5,031,164	5,049,398
4,912,697	5,001,233	5,032,482	5,049,800
4,913,957	5,001,236	5,033,232	5,050,756
4,915,109	5,001,275	5,034,808	5,051,201
4,918,466	5,001,296	5,035,036	5,051,491
4,922,683	5,001,574	5,035,711	5,052,468
4,928,479	5,003,617	5,035,864	5,053,082
4,930,447	5,003,629	5,035,956	5,053,206
4,935,930	5,003,960	5,036,105	5,053,295
4,939,769	5,004,324	5,036,106	5,054,170
4,941,854	5,004,631	5,036,390	5,054,385
4,944,883	5,005,418	5,036,632	5,054,407
4,945,762	5,005,500	5,036,719	5,055,257
4,947,030	5,007,832	5,036,849	5,055,294
4,947,047	5,008,261	5,037,382	5,055,324
4,947,163	5,009,892	5,037,428	5,055,901
4,947,650	5,010,688	5,037,602	5,056,058
4,948,584	5,011,932	5,038,058	5,056,287
4,950,466	5,012,746	5,038,255	5,057,542
4,950,603	5,012,949	5,038,573	5,057,651
4,952,576	5,013,141	5,038,598	5,063,533
4,953,073	5,013,272	5,038,789	5,077,766
4,953,932	5,013,722	5,038,848	5,081,830
4,956,801	5,014,321	5,040,212	5,083,030
4,956,284	5,014,756	5,040,260	5,084,969
4,956,690	5,014,815	5,040,486	5,094,170
4,959,660	5,014,899	5,040,589	5,098,303
4,963,902	5,015,290	5,040,916	5,113,837
4,964,460	5,015,613	5,040,938	5,116,639
4,967,232	5,015,728	5,040,970	5,124,802
4,970,088	5,016,985	5,041,203	5,130,694
4,970,154	5,016,997	5,041,517	5,133,293
4,971,329	5,017,867	5,041,740	5,145,622
4,972,271	5,017,921	5,042,015	5,147,556
4,973,546	5,017,930	5,042,795	5,900,365
4,974,040	5,017,947	5,043,184	
4,974,388	5,017,965	5,043,866	

Disclaimers

4,299,019—*Malcolm J. Roebuck*, LaSalle, Ill., DIE-SET COMBINATION FOR MAKING PIN-BACK BADGES. Patent dated Nov. 10, 1981. Disclaimer filed Sept. 14, 1992, by the assignee, Badge-A-Minit Ltd.

Hereby enters this disclaimer to claim 2 of said patent.

4,621,837—*Jory B. Mack*, Chicago, Ill., MULTI-LAYERED LABEL. Patent dated Nov. 11, 1986. Disclaimer filed Oct. 5, 1992, by the assignee, Menasha Corp.

Hereby enters this disclaimer to claims 1-3, 5, 6 and 8 of said patent.

4,805,330—*John Bubernak*, Plainville, Mass. HANGER FOR A WALL COVERING. Patent dated Feb. 21, 1989. Disclaimer filed Aug. 17, 1992, by the inventor.

The term of this patent subsequent to June 30, 2004, has been disclaimed.

4,912,092—*Harry E. Gruber*, San Diego, Calif. METHODS FOR INCREASING EXTRACELLULAR ADENOSINE AND FOR STABILIZING MAST CELLS. Patent dated Mar. 27, 1990. Disclaimer filed Jan. 7, 1991, by the assignee, The Regents of the University of Calif.

Hereby enters this disclaimer to claim 68 of said patent.

4,956,568—*Chung-Yi Su*, Milpitas; *Michael R. Ty Tan*, Mountain View; *William J. Anklam*, Santa Rosa, all of Calif. MONOLITHIC SAMPLER. Patent dated Sept. 11, 1990. Disclaimer filed Oct. 29, 1992, by the assignee, Hewlett Packard Co.

Hereby enters this disclaimer to claims 1, 4 and 5 of said patent.

4,989,590—*John Baum; Gary Thomas; James Hickman*, all of Fort Collins, Colo. IRRIGATION APPLIANCE. Patent dated Feb. 5, 1991. Disclaimer filed Apr. 21, 1992, by the assignee, Teledyne Industries, Inc.

Hereby enters this disclaimer to claims 19, 20, 21, 22 and 24 of said patent.

5,046,809—*Karl-Ulrich Stein*, Unterhaching, Fed. Rep. of Germany. COUPLING ARRANGEMENT FOR OPTICALLY COUPLING A FIBER TO A PLANAR OPTICAL WAVEGUIDE INTEGRATED ON A SUBSTRATE. Patent dated Sept. 10, 1991. Disclaimer filed July 20, 1992, by the assignee, Siemens Aktiengesellschaft.

Hereby enters this disclaimer to claims 1, 2, 6 and 9 of said patent.

Disclaimers and Dedications

4,797,276—*Corinna Herrnstadt, George G. Soares*, both of San Diego, Calif. COTTON BOLL WEEVIL, ALFALFA WEEVIL AND CORN ROOTWORM VIA CONTACT WITH A STRAIN OF BACILLUS THURINGIENSIS. Patent dated Jan. 10, 1989. Disclaimer and dedication filed Sept. 21, 1992, by the assignee, Mycogen Corp.

Hereby disclaims and dedicates to the public the entire term of said patent.

4,935,236—*Corinna Herrnstadt; George G. Soares*, both of San Diego Calif. CONTROL OF ELM LEAF BEETLE VIA CONTACT WITH A STRAIN OF BACILLUS THURINGIENSIS. Patent dated June 19, 1990. Disclaimer and dedication filed Sept. 21, 1992, by the assignee, Mycogen Corp.

Hereby disclaims and dedicates to the public the entire term of said patent.

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Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
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Box PATENT APPLICATION	New patent application and associated papers and fees.
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Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.

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	San Diego Public Library	(619) 236-5813
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Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
	Clemson University Libraries	Not Yet Operational
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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

EDWARD E. KUBASIEWICZ, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	1/23/92
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	4/16/92
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — DONALD CZAJA, Acting Director	308-0651	3/27/92
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	3/27/92
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Acting Director	308-0196	6/13/91
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — D. G. KELLY, Director	308-1782	6/26/91
SPECIAL LAWS ADMINISTRATION, GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	6/08/91
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 2300 — GERALD GOLDBERG, Director	308-0754	9/12/90
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	12/27/91
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	305-4700	6/01/91
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	8/26/90
MECHANICAL EXAMINING GROUPS		
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MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	3/17/92
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	2/10/92
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	3/20/92
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-1021	12/24/91

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during December 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,922,721 to 3,930,270 inclusive
Plant Patents ..... 3,812 to 3,823

REEXAMINATIONS

JANUARY 19, 1993

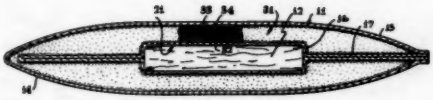
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,193,499 (1902nd)

PREFABRICATED UNITARY PACKAGE WHICH WHEN SEALED AND IRRADIATED CONFORMS CLOSELY TO CONTENTS AND BECOMES IMPACT-ABSORBING

Theodore W. Lookholder, Los Angeles, Calif., assignor to Sealed Air Corporation

Reexamination Request No. 90/001,996, Apr. 11, 1990.
Reexamination Certificate for Patent No. 4,193,499, issued Mar. 18, 1980, Ser. No. 31,175, Apr. 18, 1979.
Int. Cl.[5] B65D *81/12, 85/30*
U.S. Cl. 206—524



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–9, 11** and **13–24** is confirmed.

Claims **10** and **12** are cancelled.

New claims **25–34** are added and determined to be patentable.

1. A prefabricated unitary protective package for articles, comprising:

a container having an outer wall and a conformable inner wall and adapted to sealably enclose such articles;

the outer and inner walls being permanently presealed to each other about their mutual peripheries, defining a permanently presealed chamber between the outer and inner walls; and

expandable material presealed in the chamber between the two walls and adapted to be expanded to an impact-absorbing state and thereby to force the inner wall conformingly against such articles.

15. A prefabricated unitary protecting package for articles, comprising:

an inner wall adapted to conform to the shapes of such articles and comprising the following layers: a first layer of polyethylene film, a layer of aluminum foil, a second layer of polyethylene film, a layer of flexible material suitable for packaging, and a third layer of polyethylene film;

an outer wall permanently presealed to the inner wall about the mutual peripheries of the two walls, at manufacture, defining a permanently presealed chamber between the outer and inner walls, said outer wall comprising a layer of polyethylene film and a flexible covering layer of material suitable for packaging; and

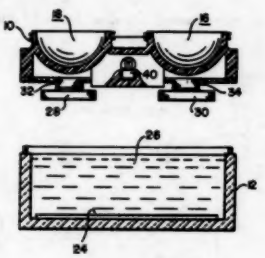
presealed in the chamber between the inner and outer walls a quantity of expandable polystyrene beads with incorporated blowing agent, and a quantity of water and surfactant.

B1 4,529,868 (1903rd)

SOFT CONTACT LENS DISINFECTING UNIT

John G. Bowen, Santa Ana, and Stephen G. Hauser, Tarzana, both of Calif., assignors to The Cooper Companies, Inc., Palo Alto, Calif.

Reexamination Request No. 90/002,012, Apr. 27, 1990.
Reexamination Certificate for Patent No. 4,529,868, issued Jul. 16, 1985, Ser. No. 448,281, Dec. 9, 1982.
Continuation-in-part of Ser. No. 317,071, Nov. 2, 1981, abandoned
Int. Cl.[5] H05B *3/06*; A61L *2/04*
U.S. Cl. 219—521



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **4** is confirmed.

Claims **1–3** and **5–9** are cancelled.

4. The electrically energized heating unit defined in claim **3**, and which includes first and second thermal cut-off switches connected to and mounted adjacent to respective ones of the heater elements to de-energize the unit should the temperature of either of the heater elements exceed a particular threshold.

B2 4,770,674 (1904th)

GAS CONDITIONING FOR AN ELECTROSTATIC PRECIPITATOR

Marco G. Tellini, Montclair, and Billy D. Pfoutz, Somerville, both of N.J., assignors to Lab, S.A., Lyon Cedex, France

Reexamination Request No. 90/002,756, Jun. 17, 1992.
Reexamination Certificate for Patent No. 4,770,674, issued Sep. 13, 1988, Ser. No. 637,993, Aug. 6, 1984.
Reexamination Certificate B1 4,770,674, issued Jul. 28, 1992.
Int. Cl.[5] B03C *1/00*
U.S. Cl. 55—5

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2–5, 7, 8, 11, 18–20, 24–30, 34–39, 43, 47** and **49–71** is confirmed.

Claims **1, 6, 9, 10, 12–17, 21–23, 31–33, 40–42, 44–46** and **48** were previously cancelled.

2. Apparatus receiving a source of air and a source of sulfur-bearing liquid for conditioning the gas within an electrostatic precipitator in the exhaust stage of an industrial plant, comprising:

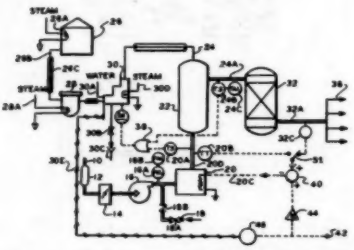
a chamber means having an output and an input said chamber means communicating with said source of sulfur-bear-

ing liquid and said source of air for raising the temperature and changing the condition of said liquid to provide therefrom gaseous oxidized sulfur said chamber means including a burner means having a pair of inputs connected to receive from said source of air and said sulfur-bearing source sulfur and air for at least providing their combustion products at said output;

converter means having an outlet and having an inlet communicating with the output of said chamber means for chemically converting at least a portion of said gaseous, oxidized sulfur into sulfur trioxide;

sensing means connected with said outlet of said converter means for providing a converted temperature signal signifying the temperature at said outlet of said converter means;

modulation means connected to said chamber means and said sensing means for varying the rate of energy transfer associated with the airflow from said source of air upstream of said converter means in response to said converted temperature signal the magnitude of said rate of energy transfer being changed in the same direction as



changes on an absolute scale of said converted temperature;

delivery means connected to said outlet of said converter means for delivering said sulfur trioxide to said precipitator;

parametric means coupled to said exhaust stage of said industrial plant for providing a parametric signal signifying at least one operating parameter of said exhaust stage of said industrial plant, said operating parameter corresponding to the demand made on said precipitator by said gas as defined by the power dissipated by the precipitator for useful work and losses; and

throttle means connected to said burner means for varying its incoming mass flow rate in response to said parametric signal, said throttle means comprising:

sulfur conveying means for varying the flow rate of said sulfur to said burner means in response to said parametric signal, said parameteric signal corresponding to at least one operating parameter associated with the handling of gas flow at said precipitator; and

air means for varying the flow rate of said air to said burner means in response to said parametric signal.

B2 4,844,723 (1905th)

GAS CONDITITONING FOR AN ELECTROSTATIC PRECIPITATOR

Marco G. Tellini, Montclair, and Billy D. Pfoutz, Somerville, both of N.J., assignors to Lab, S.A., Lyon Cedex, France

Reexamination Request No. 90/002,755, Jun. 17, 1992.
Reexamination Certificate for Patent No. 4,844,723, issued Jul. 4, 1989, Ser. No. 146,035, Mar. 24, 1988.
Division of Ser. No. 637,993, Aug. 6, 1984, Pat. No. 4,770,674
Int. Cl.[5] B03C *3/66*
U.S. Cl. 55—106

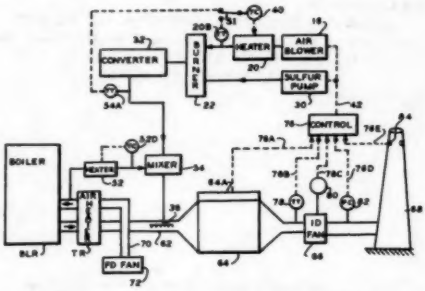
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **5–8, 10** and **11** is confirmed.

Claims **1–3** were previously cancelled.

Claim **4** is determined to be patentable as amended.

Claim **9**, dependent on an amended claim, is determined to be patentable.



4. Apparatus according to claim **[1]** *2* further comprising:

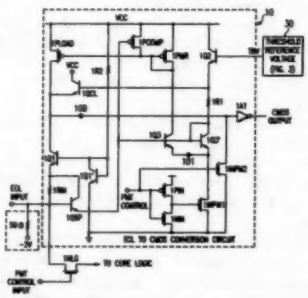
parametric means coupled to said industrial plant for providing a parametric signal signifying at least one operating parameter of said industrial plant, said operating parameter corresponding to the power dissipated by the precipitator for useful work and losses, said modulation means being operable to vary the energy flow rate associated with the airflow from said source of air to said mixing means in response to both said converted temperature signal and said parametric signal.

B1 5,027,014 (1906th)

TRANSLATOR CIRCUIT AND METHOD OF OPERATION

Alan S. Bass, Plano; Stephen R. Schenck, McKinney, and Robert C. Martin, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Reexamination Request No. 90/002,588, Feb. 12, 1992.
Reexamination Certificate for Patent No. 5,027,014, issued Jun. 25, 1991, Ser. No. 502,471, Mar. 30, 1990.
Int. Cl.[5] H03K *19/092, 19/094, 19/086, 19/003*
U.S. Cl. 307—475



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–33** are determined to be patentable as amended.

1. A circuit for converting from first logic **[**on/off**]** *on and*

off input levels to second logic *on and off* output levels, said *converter* circuit including only positive *supply* voltages with respect to ground, said *converter* circuit comprising:

a threshold reference voltage *circuit for providing a threshold reference voltage* measured positive with respect to ground, said *threshold* reference voltage used to set [the] *a threshold input* level for switching *the output* between said *logic* on and off levels *when the logic input level crosses said threshold input level;*

an output node for [driving] *providing* said [on/off] *providing* said [on/off] *logic on and off* output levels;

a control [switch] *transistor* biased continuously in the conducting condition, said [switch] *control transistor* operable for providing high and low current to said output node; and

circuitry for [quickly] changing said control [switch] *transistor* between said high and low current conditions dependent upon whether [or not] the [voltage condition] *logic input level* presented to [said] *the input of the converting* circuit [input] is above or below said [reference voltage where] *threshold input switching level wherein* above represents the logical on condition and below represents the logical off condition of an input signal.

B1 Des. 298,986 (1901st)

ADJUSTABLE VEHICLE SEAT

John W. Carter, Moline, Ill., assignor to The Wise, Co., Inc., Memphis, Tenn.

Reexamination Request No. 90/002,619, Jan. 22, 1992.

Reexamination Certificate for Patent No. Des. 298,986, issued Dec. 20, 1988, Ser. No. 889,504, Jul. 24, 1986.

U.S. Cl. D6—356

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The single claim is cancelled.

[The ornamental design for an adjustable vehicle seat, as shown and described.]

REISSUES

JANUARY 19, 1993

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

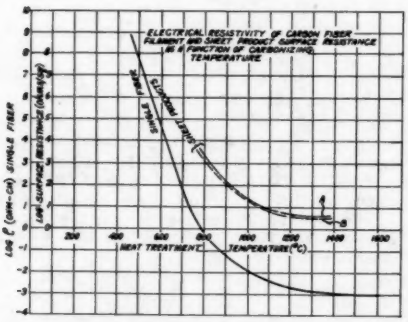
Re. 34,162
CONTROLLED SURFACE ELECTRICAL RESISTANCE CARBON FIBER SHEET PRODUCT

George P. Boyd, Jr., Attleboro, Mass., assignor to Zoltek Corporation, St. Louis, Mo.

Original No. 4,728,395, dated Mar. 1, 1988, Ser. No. 660,051, Oct. 12, 1984. Application for reissue Feb. 20, 1990, Ser. No. 483,531

Int. Cl.[5] D21H *13/50*

U.S. Cl. 162—138 40 Claims


ELECTRICAL RESISTIVITY OF CARBON FIBER FILAMENT AND SHEET PRODUCT SURFACE RESISTANCE AS A FUNCTION OF CARBONIZING TEMPERATURE
SHEET STRIPS
FILAMENT STRIPS
LOG ρ (OHM-CM) SINGLE FIBER
LOW SURFACE RESISTIVITY (OHMS/SQ)
HEAT TREATMENT
TEMPERATURE (°C)

1. A method of manufacturing a plurality of different value controlled resistivity carbon fiber sheet products employing a carbonizable fiber starting material; said method comprising [oxidizing and stabilizing the carbonizable fiber starting material at an elevated temperature of the order of 220 degrees Centigrade to effect molecular aromatic rearrangement of the fibers,] selectively *partially* carbonizing [the] *previously* oxidized and stabilized fiber starting material for a predetermined time period in an oxygen free atmosphere within a furnace at [a] selected temperature *values* within a temperature range from 370 degrees Centigrade to about 1300 degrees Centigrade by soaking the stabilized fiber starting material at the selected temperature for the predetermined period of time to provide a [desired] *preselected known volume* electrical resistivity to the *partially* carbonized fibers *corresponding to that volume electrical resistivity value required to provide the preselected desired surface resistance value for the finished sheet products,* and thereafter processing the *partially* carbonized fibers into [desired electrical resistivity] *homogeneous* carbon fiber sheet products [having the form of non-woven paper or woven or knitted fabric sheet products] having *the* preselected desired surface electrical [resistivities] *resistances.*

40. A homogeneous partially carbonized fiber sheet product free of non-carbonized fiber starting materials and having a homogeneous partially carbonized surface which exhibits a predesigned surface electrical resistance that is determined in advance by a predesigned partial carbonizing time/heat treatment of previously oxidized and stabilized non-carbonized fiber starting material and being the product of a partial carbonizing treatment designed to provide the resultant desired predetermined surface electrical resistance to the end product by being heated for a predetermined period of time at temperature values ranging between about 370 degrees Centigrade and about 1300 degrees Centigrade to provide a known preselected electrical volume resistivity to the partially carbonized fibers corresponding to that required to provide the preselected desired surface electrical resistance for the finished sheet products.

Re. 34,163
SYMMETRICAL FAULT CURRENT DETECTOR

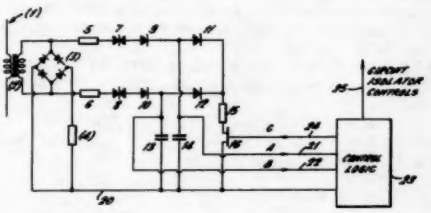
David R. Aubrey, Saughall, and Ian Jameson, Wirral, both of United Kingdom, assignors to Electricity Association Services Limited, London, United Kingdom

Original No. 4,797,775, dated Jan. 10, 1989, Ser. No. 854,246, Apr. 21, 1986. Application for reissue Mar. 12, 1991, Ser. No. 668,101

Claims priority, application United Kingdom, May 20, 1985, 8512746

Int. Cl.[5] H02H *3/087*

U.S. Cl. 361—93 10 Claims



1. A fault current detector comprising:

current transformer means adapted to be inductively coupled to an alternating current power line to provide a signal representative of current flowing in the alternating current power line; and

means responsive to the signal to provide a fault current indication if the alternating current flow represented by the signal exceeds a predetermined threshold in each polarity but not to provide the fault current indication if the alternating current flow exceeds the predetermined threshold in only one polarity, *said means responsive to the signal being independently responsive to the alternating current flow in half-cycles of respective polarity of the alternating current flow to provide a respective indication of the flow in each polarity exceeding the predetermined threshold and comprising a full wave rectifier for rectifying the output signal of the current transformer means, a resistance connected across the output terminals of the rectifier and a respective threshold switch connected to each input terminal of the rectifier and arranged to be triggered in response to the voltage between the respective input terminal and a common output terminal of the rectifier exceeding the predetermined threshold voltage.*

Re. 34,164
SYNTHETIC HYDROTALCITE

Chanakya Misra, Plum Borough, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Original No. 4,904,457, dated Feb. 27, 1990, Ser. No. 788,853, Oct. 18, 1985. Continuation-in-part of Ser. No. 595,374, Mar. 30, 1984, abandoned. Application for reissue Feb. 4, 1991, Ser. No. 650,730

The portion of the term of this patent subsequent to Apr. 7, 2004, has been disclaimed.

Int. Cl.[5] C01B *31/24;* C01F *5/24, 11/18, 7/02*

U.S. Cl. 423—115 35 Claims

13. A method of producing hydrotalcite comprising:

reacting activated magnesia produced by heating magnesium

carbonate or magnesium hydroxide to between about 500°–900° C. with an aqueous solution containing aluminate,

carbonate and hydroxyl ions at a pH above about 13 to form hydrotalcite at a conversion yield greater than about 75%.

Re. 34,165

POTENT THYMOPENTIN ANALOGS

Gideon Goldstein, Short Hills; George Heavner, Flemington; Daniel Kroon, and Tapan Audhya, both of Bridgewater, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Original No. 4,629,723, dated Dec. 16, 1986, Ser. No. 625,344, Jun. 27, 1984. Application for reissue Apr. 25, 1990, Ser. No. 514,184

Int. Cl.[5] **A61K** *37/02, 37/43;* **C07K** *7/06, 7/48*

U.S. Cl. 514—17 **14 Claims**

1. A peptide having the formula:

R-V-W-X-Y-Z-R^1

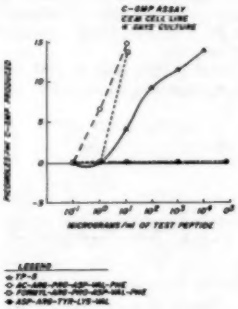
or a pharmaceutically-acceptable acid- or base-addition salt thereof, wherein:

R is H, loweralkyl, formyl, or loweralkanoyl;

V is ARG or D-ARG;

W is [LYS, D-LYS,] PRO, dehydro-PRO, or AIB;

X is ASP, D-ASP, GLU, or D-GLU;



Y is VAL, LYS, LEU, ILE, GLU, ALA, GLN, D-VAL, D-LYS, D-LEU, D-ILE, D-GLU, D-ALA, or D-GLN;

Z is PHE, HIS, TRP, D-PHE, D-HIS, or D-TRP; *and*

R^1 is OH or NR^2R^3; and R^2 and R^3 are each independently selected from H or loweralkyl[; provided that when W is LYS, X is D-ASP, GLU, or D-GLU, and Y is VAL, Z is other than PHE].

PLANT PATENTS

GRANTED JANUARY 19, 1993

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

8,102
ROSE PLANT INTERPRINCE

Peter Ilsink, NE Leersum, Netherlands, assignor to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Jun. 14, 1991, Ser. No. 715,452
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—23 1 Claim

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its distinctive pure white color, its ability to produce flowers borne in clusters that open simultaneously, its vigorous upright growth, good vase life, and high cut flower production.

8,103
PLUM TREE NAMED 'COMPACT FRIAR'

Henry G. Wong, 900 Jackson St., Unit 104, Oakland, Calif. 94607

Filed Mar. 11, 1991, Ser. No. 667,280
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—38.1 1 Claim

1. A new and distinct variety of plum tree, substantially as illustrated and described, identified by the characteristics enumerated above, and characterized particularly as to novelty in comparison to other plum trees by the genetically dwarf size of tree, but otherwise similar to the Friar plum tree from which it mutated.

8,104
CARNATION PLANT NAMED CFPC MAJESTIC

Walter H. Jessel, Jr., Salinas, Calif., assignor to California Florida Plant Co., L.P., Salinas, Calif.

Filed Mar. 28, 1991, Ser. No. 676,810
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—70.5 1 Claim

1. A new and distinct variety of carnation plant, substantially as shown and described, characterized particularly by flowers of attractive orchid pink coloration.

8,105
CHRYSANTHEMUM PLANT NAMED CONGA

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jun. 14, 1991, Ser. No. 715,633
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—74.1 1 Claim

1. A new and distinct Chrysanthemum plant named Conga, as described and illustrated.

8,106
CHRYSANTHEMUM PLANT—FUNSHINE CULTIVAR

Jacques C. M. van der Knapp, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Jun. 24, 1991, Ser. No. 719,461
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—76 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Funshine, substantially as herein shown and described, which:

(a) exhibits attractive relatively small anemone flowers having an overall diameter of approximately 40 mm. wherein the petals are white and the disc florets particularly towards the center bear light-red coloration on the distal ends,
(b) bears flowers in a somewhat pyramidal configuration,
(c) exhibits a flower response period of approximately seven and one-half weeks,
(d) forms attractive dark green foliage, and
(e) has the ability to produce flowers of commercially acceptable quality throughout the year in a cut mum production program.

8,107
CHRYSANTHEMUM PLANT—GIRAFFE CULTIVAR

Jacques C. M. van der Knapp, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Jun. 25, 1991, Ser. No. 720,584
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—82.1 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant names Giraffe, substantially as herein shown and described, which:

(a) exhibits attractive relatively large clear white single flowers commonly comprising two or three rows of petals which have a yellow-green center,
(b) bears flowers in a generally flat capitulum configuration when mature,
(c) exhibits a flower response period of approximatel eight and one-half weeks,
(d) exhibits resistance to white rust,
(e) forms attractive dark green foliage, and
)f) has the ability to produce flowers of commercially acceptable quality throughout the year in a cut mum production program.

8,108
CHRYSANTHEMUM PLANT NAMED MAMBO

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jun. 14, 1991, Ser. No. 715,631
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—82.3 1 Claim

1. A new and distinct Chrysanthemum plant named Mambo, as described and illustrated.

8,109
IMPATIENS PLANT NAMED WALTZ

Klara Dehan, Holon, Israël, assignor to Danziger - "Dan" Flower Farm, Post Beit Dagan, Israel

Filed Jul. 16, 1991, Ser. No. 730,607
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—87.6 1 Claim

1. A new and distinct cultivar of Impatiens plant named Waltz, as illustrated and described.

8,110
IMPATIENS PLANT NAMED SAMBA

Klara Dehan, Holon, Israel, assignor to Danziger - "Dan" Flower Farm, Post Beit Dagan, Israel

Filed Jul. 16, 1991, Ser. No. 730,609
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—87.6 1 Claim

1. A new and distinct cultivar of Impatiens plant named Samba, as illustrated and described.

8,111

IMPATIENS PLANT NAMED RONDO

Klara Dehan, Holon, Israel, assignor to Danziger - "Dan" Flower Farm, Post Beit Dagan, Israel

Filed Jul. 16, 1991, Ser. No. 730,610

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—87.6 **1 Claim**

1. A new and distinct cultivar of Impatiens plant named Rondo, as illustrated and described.

8,112

IMPATIENS PLANT NAMED FLAMENCO

Klara Dehan, Holon, Israel, assignor to Danziger - "Dan" Flower Farm, Post Beit Dagan, Israel

Filed Jul. 16, 1991, Ser. No. 730,611

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—87.6 **1 Claim**

1. A new and distinct cultivar of Impatiens named Flamenco, as illustrated and described.

8,113

CHRYSANTHEMUM PLANT NAMED CUMBIA

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jun. 14, 1991, Ser. No. 715,634

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—74.1 **1 Claim**

1. A new and distinct Chrysanthemum plant named Cumbia, as described and illustrated.

PATENTS

GRANTED January 19, 1993

ERRATA

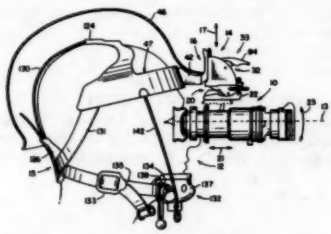
For CLASS	See PATENT NO.
033-203	5,179,784
476-051	5,179,865
606-062	5,179,915
482-143	5,180,161
417-234	5,180,283
604-266	5,180,387
552-201	5,180,758
546-278	5,180,822
562-017	5,180,846
257-491	5,181,083
257-094	5,181,084
257-094	5,181,085
257-018	5,181,086
257-194	5,181,087
257-331	5,181,088
257-299	5,181,089
257-344	5,181,090
257-355	5,181,091
257-361	5,181,092
257-223	5,181,093
257-372	5,181,094
257-370	5,181,095
257-530	5,181,096
257-788	5,181,097
363-089	5,181,159
363-097	5,181,160
369-048	5,181,161
364-419	5,181,162
364-419	5,181,163

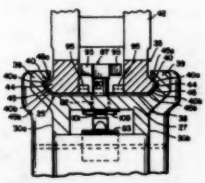
PATENTS

GRANTED JANUARY 19, 1993

GENERAL AND MECHANICAL

5,179,735
OPTICAL EQUIPMENT MOUNTING DEVICE
Walter Thomanek, Montreal, Canada, assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
Division of Ser. No. 325,748, Mar. 20, 1989, Pat. No. 5,064,278. This application Aug. 14, 1991, Ser. No. 744,757
Int. Cl.[5] A42B *3/02, 1/24*
U.S. Cl. 2—6 **5 Claims**

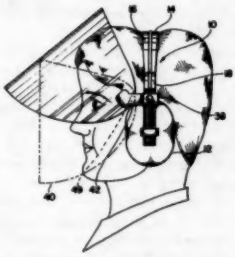




1. A head support assembly of the type having a front attachment for mounting a device for holding an optical apparatus on the line of vision of a wearer of the head support assembly, said assembly comprising a composite head piece formed by a lower U-shape band portion having an inner surface at the front thereof to fit across the forehead of the wearer and inner surfaces on the inside of rearwardly extending side leg portions of the U-shape band portion, and an upper band portion formed integrally with the side leg portions and extending upwardly and then inwardly to a central portion, the upper band portion and the central portion defining inner surfaces overlying the crown of the wearer's head, a top webbing secured at an upper end to the central portion of said head piece and at a lower end to a back pad to be located behind the wearer's head, a pair of elongated side webbing means each secured at an upper end to a respective rear end portion of said side leg portions of said head piece at one side of the head piece, each side webbing means passing through said back pad and then forward on the opposite side of the wearer's head, a chin piece shaped to fit over the wearer's chin, each side webbing means terminating at a connection means at a forward end thereof, said connection means at said forward end being attachable to opposite sides of said chin piece, and a hold-down cord attached at opposite ends to said side leg portions of said head piece forward of said rear end portions and having a connector at the mid portion thereof for releasable connection to a lower portion of said chin piece.

5,179,736
COMBINATION HEADSET AND FACE MASK DEVICE
Thomas A. Scanlon, 40 Hawthorne Ave., Barrington, R.I. 02806
Filed Sep. 30, 1991, Ser. No. 768,002
Int. Cl.[5] A61F *11/00*
U.S. Cl. 2—209 **12 Claims**

1. An improved headset and face mask combination device wherein the headset is of the type having a flexible headband adapted to overlie the wearer's head and terminating in ends adapted for disposition opposite the wearer's ears and each such end in turn provided with an ear cup attached thereto and having generally rotational movement with respect to the end to which it is attached and at least some pivotal back and forth lateral movement in a plane defined by the transverse extent of said headband and a face mask rotationally movable between upper and lower positions supported from said headband; the



improvement comprising, restraining means for essentially eliminating possible relative rotational motion of said ear cups relative to said headband terminal ends, said restraining means including a bridge member overlying portions of each said headband end, said bridge member further including means for fixedly attaching itself to said ear cups at two laterally-spaced locations on said ear cups and on either side of said headband ends.

5,179,737
ODOR REMOVER DEVICE
Vernon F. Ricard, Rte. 2, Crookston, Minn. 56716
Division of Ser. No. 669,474, Mar. 14, 1991, Pat. No. 5,136,729. This application Dec. 2, 1991, Ser. No. 801,008
Int. Cl.[5] E03D *9/052*
U.S. Cl. 4—213 **5 Claims**

1. An odor removing attachment for use with a toilet positioned in a bathroom having vertical walls and having a ceiling, a conventional ceiling fan mounted in an opening in the ceiling for exhausting gases therethrough, a switch mounted on a vertical wall in the bathroom for energizing the ceiling fan, the toilet including a toilet bowl having an upper surface, and

a rear edge portion, an oval-shaped toilet seat, hinges hingedly connecting a toilet seat to the toilet bowl including a pair of hinge posts projecting upwardly from the toilet bowl adjacent the rear portion thereof, said odor removing attachment comprising,

an odor collector positioned upon the upper rear surface of the toilet bowl and including a generally rectangular shaped, elongate hollow intake member having lower, upper and side walls and having an open front end defining an inlet and having an open rear end defining an outlet, said outlet being defined by said upper, lower and side walls and being completely unobstructed, a pair of brackets secured to said intake member and extending laterally therefrom for securing said intake member to the hinge post on the toilet bowl,

elongate conduit means having one end thereof connected in communicating relation to the outlet of the intake member,

a downwardly convex auxiliary venturi housing secured to the ceiling in overlying relation to the ceiling fan, said venturi housing including an inverted frustro-conical member having an open upper end and an open lower end, a radial flange integral with said frustro-conical member adjacent the upper end thereof and extending radially outwardly therefrom, means connecting the other end of said conduit means to said frustro-conical member in spaced relation to said open lower end whereby when the fan is energized, gases will be moved through the intake member, conduit means and then into the venturi housing, and whereby air will be simultaneously moved through the open lower end of said frustro-conical member to produce a venturi effect to thereby increase the velocity of the gases passing through the conduit and through the ceiling fan.

5,179,738

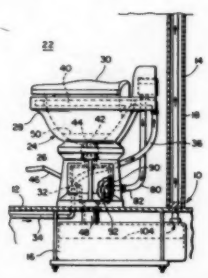
R. V. TOILET VENTING SYSTEM

Edward W. Sowards, 160 Ridge Rd., Ben Lomond, Calif. 95005

Filed Jul. 11, 1991, Ser. No. 728,283

Int. Cl.[5] E03D *9/052*

U.S. Cl. 4—213 **7 Claims**



1. In a toilet system including an upwardly opening toilet bowl having upper rim flushing water outlet means and a lower discharge outlet provided with a manually openable and closable valve, closed passage means communicating said discharge outlet with the interior of an upper portion of a holding tank disposed below said bowl and equipped with an upwardly projecting vent pipe including an upper discharge end, upper inner rim level flushing water supply means operative to supply flushing water to said flushing water outlet means and control valve means operative, responsive to manual opening of said valve, to supply water under pressure to said water supply means and to terminate the supply of water under pressure to said water supply means responsive to manual closing of said valve; the improvement including a remotely operable exhaust blower means operatively associated with said vent pipe for causing vapors to flow upwardly therethrough from within the upper portion of said holding tank and discharge of said vapors into the ambient atmosphere, a vent line having an inlet end and an outlet end opening into said closed passage means, a float-type liquid flow preventing valve communicating said inlet end with said flushing water supply means, said liquid flow preventing valve including fluid flow controlling means operative, in the absence of water under pressure flowing through said flushing water supply means, to allow reverse air and vapor flow through said flushing water outlet means, said flushing water supply means and into and through said liquid flow preventing valve into said vent line inlet end, and operative to prevent any flow of liquid through said liquid flow preventing valve from said flushing water supply means into said vent line inlet end in the presence of water under pressure flowing through said flushing water supply means.

5,179,739

WATER CONSERVING TOILET ASSEMBLY

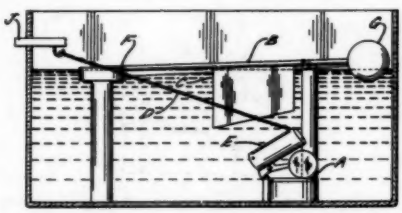
Thomas A. Mann, 73 Husford Ave., Leonardo, N.J. 07737

Continuation of Ser. No. 367,229, Jun. 14, 1989, abandoned.

This application Dec. 5, 1990, Ser. No. 622,192

Int. Cl.[5] E03D *1/00, 1/34*

U.S. Cl. 4—378 **2 Claims**



1. A water saving toilet apparatus for operation within the water tank of a toilet having a flush valve, a flush handle and a float ball, said apparatus comprising:

a counter-weight connected to said flush handle of said toilet, said counter-weight comprising a cylindrical shaped portion having an opening near the top and a bottom wall at the bottom of said cylindrical portion, said bottom wall having a hole, said counter-weight adapted to be pivotally attached to said flush valve near the bottom of said toilet tank so that said counter-weight is capable of moving from a relatively horizontal position to a relatively upright position within said toilet tank, so that said counter-weight can hold water for a time in said relatively upright position, said counter-weight in connection with said flush valve of said toilet so that said flush valve is in a closed position when cylinder is in a relatively horizontal position and said flush valve is in an open position when said counter-weight is in an upright position, so that said counter-weight is capable of being raised to an upright position upon movement of said flush handle and said flush valve is capable of being opened by said movement of said flush handle, said counter-weight capable of remaining in said upright position for a time and of holding said flush valve in an open position until said counter-weight has been emptied of water so that said emptying of said water through said counter-weight takes a longer time to occur than the time it takes said flush valve to empty said tank, said float ball connected to a controller arm, said controller arm connected to an inlet valve capable of filling said toilet tank with water upon the downward movement of said float ball, said controller arm having a downwardly projecting portion, said downwardly projecting portion capable of contacting said counter-weight when said counter-weight is in said upright position so that said counter-weight supports said float ball through said downwardly projecting portion

and said controller arm and delays the filling of said toilet tank by said inlet valve until said counter-weight has substantially emptied of water.

5,179,740

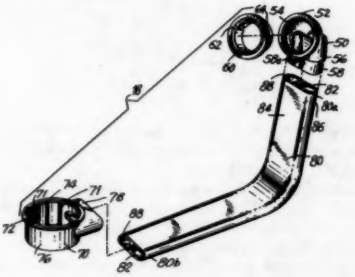
ENCAPSULATED OVERFLOW SYSTEM FOR SINKS AND THE LIKE

Ronald M. Marsilio, Mogadore, Ohio, and Karl G. Ohaus, Chatham, N.J., Drew J. Yuhas, Pennington, N.J., assignors to American Standard Inc., New York, N.Y.

Filed Apr. 24, 1991, Ser. No. 690,246

Int. Cl.[5] E03C *1/24*

U.S. Cl. 4—651 **19 Claims**



1. An overflow system for a sanitary fixture having a basin, said basin having a finish side and a non-finish side, said non-finish side being coated with a layer of plastic material, said basin further including a drain opening coupleable to a main drain and an overflow opening, comprising a tube formed from a thermoplastic material which tube is bendable along a longitudinal axis and having first and second ends, first coupling means for coupling said first end of said tube to said overflow opening, second coupling means for coupling said second end of said tube to said drain opening, said tube including reinforcing means protruding internally thereof in the form of a rib for preventing internal deformation of said tube when said tube is encapsulated in said layer of plastic material during a molding process.

5,179,741

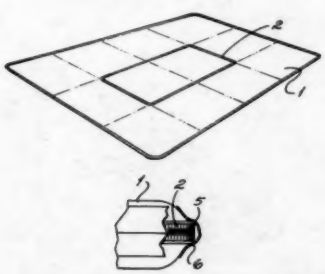
EASILY STORED INFANT PILLOW AND BLANKET

Steven C. Book, North Hollywood, Calif., assignor to Auto-Shade, Inc., North Hollywood, Calif.

Filed Sep. 10, 1991, Ser. No. 757,079

Int. Cl.[5] A47G *9/00*

U.S. Cl. 5—417 **5 Claims**



1. A blanket that can be folded into a pillow, comprising:

a fabric sheet having a first surface and a second surface, said fabric sheet being adapted to be folded into a pillow having three unattached edges; and

zipper attached directly to said first surface of said fabric sheet for fastening together said unattached edges of said fabric sheet when said fabric sheet is folded, said zipper being arranged generally centrally on said blanket in a rectangular pattern.

5,179,742

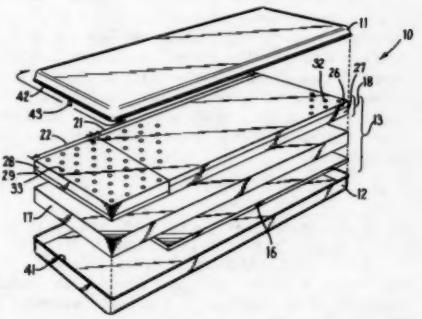
PRESSURE REDUCTION MATTRESS

Joseph F. Oberle, Portage, Mich., assignor to Stryker Corporation, Kalamazoo, Mich.

Filed Nov. 1, 1991, Ser. No. 786,757

Int. Cl.[5] A47C *27/22*

U.S. Cl. 5—464 **38 Claims**



20. A mattress, comprising: a fiber layer which is a sheet of fiber material, a top layer made of a resilient material and disposed on said fiber layer, and a further layer made of a foam material and provided immediately beneath said fiber layer, wherein said top layer has a foot support section and an upper body support section, said further foam layer extending beneath said upper body support section but not said foot support section.

5,179,743

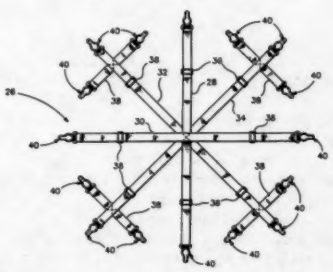
WATERBED SHEET ATTACHMENT SYSTEM

Bennie L. Lanman, 1105 E. Broadway, Princeton, Ind. 47670

Filed Jun. 4, 1990, Ser. No. 533,151

Int. Cl.[5] A47C *21/02*

U.S. Cl. 5—498 **3 Claims**



1. A waterbed sheet attachment system comprising:

a waterbed harness assembly formed from a plurality of straps that criss-cross each other underneath a waterbed mattress, these straps having outer ends to which are secured sheet attachment assemblies;

a plurality of sheet attachment assemblies each having an elongated locking member and a sheet locking bracket;

said elongated locking member is in the form of a flat strip having a top end, a bottom end, a front surface and a rear

surface, an anchor head extends from said rear surface adjacent said top end, said anchor head functions as structure for attaching said elongated locking member to said sheet locking bracket;

said elongated locking member has a neck portion extending outwardly from its rear surface adjacent its bottom end and a slide lock button having a predetermined diameter D1 is formed on said neck portion;

said sheet locking bracket is formed from a flat piece of material having a head portion and an elongated body portion having a longitudinally extending axis, a harness strap slot and an anchor head slot are formed in said head portion;

the elongated body portion of said sheet locking bracket has a longitudinally extending slide lock button slot having a predetermined width W2 that is less than D1, an eyelet aperture is formed at the top end of said slide lock button slot and it has a width W1 that is greater than D1; and

said waterbed harness assembly has a central longitudinal strap, a central lateral strap, a left diagonal strap and a right diagonal strap that criss-cross and are stitched together as one.

5,179,744

HOSPITAL BED WITH INFLATABLE AND COLLAPSIBLE SIDE EDGES AND LATERALLY-MOVABLE SIDE GUARDS

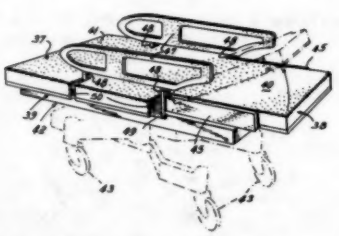
L. Dale Foster, Brookville, Ind., and James H. Breidenbach, Cincinnati, Ohio, assignors to Hill-Rom Company, Inc., Batesville, Ind.

Division of Ser. No. 627,486, Dec. 14, 1990, Pat. No. 5,083,332, which is a continuation-in-part of Ser. No. 576,837, Sep. 4, 1990, Pat. No. 5,077,843, which is a continuation-in-part of Ser. No. 386,210, Jul. 28, 1989, Pat. No. 4,985,946. This application Nov. 4, 1991, Ser. No. 787,600

The portion of the term of this patent subsequent to Jan. 7, 2009, has been disclaimed.

Int. Cl.[5] A61G *7/00*

U.S. Cl. 5—600 **4 Claims**



1. A hospital bed comprising:

a base,

a bed frame mounted on said base,

a plurality of patient support panels mounted on said base in a longitudinally-spaced series,

a mattress overlying said panels;

said mattress having a plurality of main mattress sections, each having an upper surface, and having a plurality of side sections substantially hollow on each side of said main mattress sections, each of which side sections is selectively individually inflatable to widen at least a portion of said bed, said side sections when inflated having upper surfaces substantially co-planar with said upper surfaces of said main mattress sections to provide a patient support surface of extended width, each of which side sections is selectively individually deflatable and inwardly collapsible to narrow at least a portion of said bed to provide a patient support surface of narrowed width.

5,179,745

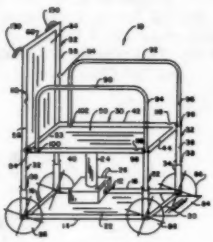
ELEVATING CONVERTIBLE WHEELCHAIR

Neil H. Hebert, and Debra M. Hebert, both of Rt. 1, Box 73X, Mitchell La., Des Allemands, La. 70030

Filed Apr. 8, 1991, Ser. No. 681,606

Int. Cl.[5] A47C *13/00*

U.S. Cl. 5—620 **28 Claims**



1. An elevating convertible wheelchair, comprising:

a lower support frame means carrying a plurality of rotating wheels attached thereto;

a plurality of telescoping leg means fixedly anchored at their lower ends to the lower support frame means and extending vertically therefrom;

a seat frame means carried by upper ends of the leg means;

a backrest means hingedly attached to the seat frame means and moveable from a first, normally vertically oriented position in perpendicular relationship to the seat frame means to a second position, substantially co-planar with said seat frame means;

a secondary backrest support means hingedly attached to a free end of said backrest means and moveable between a normally co-planar position with said backrest means to a position substantially perpendicular to said backrest means, so as to support the free end of the backrest means when the wheelchair is converted to a flat bed;

a means for elevating the seat frame means to a desired level, said elevating means being carried by the lower frame means;

a connecting panel means secured to at least one side of the wheelchair for covering a space between the converted flat bed and an adjacent side of a regular patient bed; and

a detachable arm rest means removably engageable with at least one of said leg means.

5,179,746

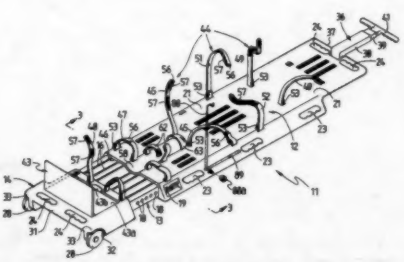
STRETCHER

D. Randall Rogers, 4019 Henning Dr., Mobile, Ala. 36619

Filed Sep. 23, 1991, Ser. No. 763,568

Int. Cl.[5] A61G *1/02*

U.S. Cl. 5—625 **31 Claims**



1. A stretcher operated by one or more persons for transporting an injured patient, comprising:

(a) an elongated body board including an upper surface on

which said patient's upper body and upper leg portions are supported and a plurality of handles formed along each of a pair of opposing lateral margins thereof by a pair of extension portions extending laterally and downwardly from said upper surface on opposite side thereof to form said handles below and laterally of said upper surface;

(b) extension means longitudinally and slidably received within the body board for supporting said patient's lower leg portion, ankles and feet such that said extension means can be extended selected distances from said body board to accommodate patients of different height; and

(c) vertical support means connected to said extension means in perpendicular extension therefrom for supporting a patient resting on said body board and said extension means when said body board and said extension means are tilted upwardly about one end of said extension.

5,179,747

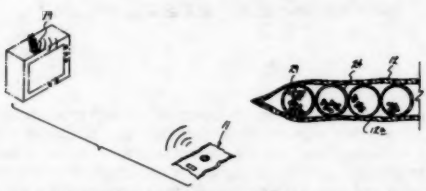
PILLOW RADIO APPARATUS

Robert C. Zink, P.O. Box 4406, State Line, Nev. 89449

Filed Feb. 14, 1992, Ser. No. 835,362

Int. Cl.[5] A47G *9/00*; G11B *31/00*

U.S. Cl. 5—639 **2 Claims**



1. A pillow radio apparatus, comprising,

a flexible pillow casing defining an enclosure therewithin, the pillow casing including flexible top web coextensive with and secured to a bottom web, and

a cover flap hingedly mounted to the top web, the cover flap positioned within a window within the top web, and wherein the cover flap includes a first hook and loop fastener strip securable to a second hook and loop fastener strip mounted to the top web, and

a radio receiver unit mounted within the enclosure projecting into the window under the cover flap, and

a speaker member medially directed through the top web in audio communication with the radio receiver unit, and

a television transmitter antenna, including an antenna body, wherein the antenna body includes a plurality of adhesive strips, the adhesive strips are arranged for securement to a television housing, and the antenna including a connector member directed into the television audio output for directing an audio signal to the radio receiver unit, and

a serpentine pneumatic chamber coextensively directed throughout the enclosure within the pillow casing, and an inflation valve in pneumatic communication with the pneumatic chamber projecting through the casing for effecting selective inflation of the chamber, and

the speaker member includes a speaker housing, the speaker housing positioned within a housing member, the housing member including fluid filled wall structure in surrounding relationship relative to the speaker housing, and the housing member further defining a housing cavity receiving the speaker housing, and the housing cavity including a plurality of first deformable fluid filled capsules contained within the housing cavity between the speaker housing and the fluid filled walls.

5,179,748

KEY RING AND SCREWDRIVER DEVICE

Joseph G. Lipic, St. Louis, Mo., assignor to Alexander Manufacturing Company, St. Louis, Mo.

Filed Dec. 11, 1991, Ser. No. 804,914

Int. Cl.[5] B25F *1/02*

U.S. Cl. 7—165 **3 Claims**

1. A key ring and screw driver device comprising:

a hollow tubular handle having opposite open ends;

a reversible screw driver blade having different blade ends and an intermediate polygonal cross sectional area, said reversible screw driver blade insertable into one open end of said hollow tubular handle for storage therein;

a ferrule mounted in the opposite open end of said hollow tubular handle, said ferrule having an outer internally threaded section adjacent the associated open end of said hollow tubular handle and an inner polygonally shaped section spaced from the associated open end of said hollow tubular handle, the outer internally threaded section having a cross sectional dimension greater than said reversible screw driver blade in order to freely accommodate same, the inner polygonally shaped section having a complementary shape and size for receiving the intermediate polygonal cross sectional area of said reversible screw driver blade in driving engagement therewith; and

a key ring having a threaded end for complementary threaded engagement with the outer threaded section of said ferrule when the screw driver blade is insertable in said one open end of said hollow tubular handle for storage therein.

5,179,749

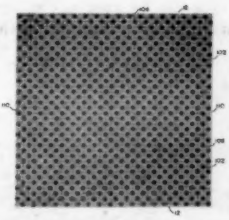
SEAMLESS MODULAR TILE

Ronald Magee, LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed May 6, 1991, Ser. No. 695,966

Int. Cl.[5] D06B *1/02*

U.S. Cl. 8—150 **8 Claims**



7. Method to jet dye carpet tiles on a dye machine having a plurality of rows of electronically controlled dye jets in each row and a computer controlled controller to actuate selected dye jets at preselected times comprising the steps of: moving a carpet tile under the rows of dye jets and causing the dye jets to form a subliminal background design on top of the carpet tile, continue moving the carpet tile under the dye jets and causing the dye jets to place a second design on top of the subliminal background design with a portion of the second design crossing the edge of the carpet tile and removing the dyed carpet tile from the jet dye machine.

5,179,750

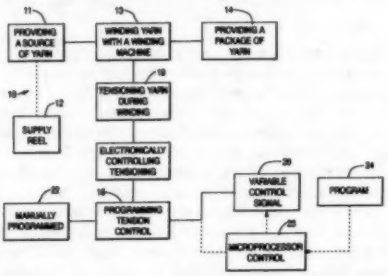
METHOD FOR WARPING USING PROGRESSIVELY CONTROLLED TENSION ON A DYE BEAM

Francis S. Moussalli, 3508 Marlboro Ct., Charlottesville, Va. 22901

Continuation of Ser. No. 540,317, Jun. 20, 1990, abandoned, which is a continuation of Ser. No. 421,115, Oct. 13, 1989, abandoned, which is a continuation of Ser. No. 265,767, Nov. 1, 1988, abandoned. This application Feb. 22, 1991, Ser. No. 659,539

Int. Cl.[5] D06B *5/18;* **B65H** *55/04, 59/00*

U.S. Cl. 8—155.1 **6 Claims**



1. A method for winding yarn for dyeing on a beam, comprising:

providing a beam having a core about which yarn to be dyed is to be wound; and

winding said yarn on said beam initially at a substantially uniform pre-determined low tension across the width of said beam and progressively increasing warping tension on said wound yarn as the diameter of the yarn on the beam increases, whereby beam core diameter may be reduced and improved uniformity of dyeing of said yarn may be obtained.

5,179,751

VEHICLE FOR LAYING DISMOUNTABLE BRIDGES

Hans N. Wiedeck, Mühlheim/Ruhr, Fed. Rep. of Germany, assignor to Krupp Industrietechnik GmbH, Duisburg, Fed. Rep. of Germany

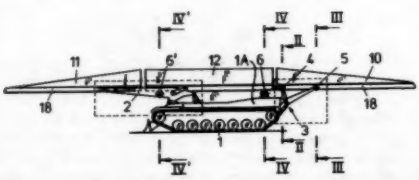
PCT No. PCT/EP89/01258, § 371 Date May 2, 1991, § 102(e) Date May 2, 1991, PCT Pub. No. WO90/05216, PCT Pub. Date May 17, 1990

PCT Filed Oct. 20, 1989, Ser. No. 671,750

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1988, 3837122

Int. Cl.[5] E01D *15/12, 21/00*

U.S. Cl. 14—2.4 **19 Claims**



1. In a vehicle for laying movable bridges, including a laying device, disposed at one end of the vehicle, for displacing and laying a bridge which includes bridge sections that can be assembled on the vehicle, and a pick-up device, disposed at a position on the vehicle which is spaced from said laying device in a longitudinal direction of the vehicle, for picking up and supporting a bridge section so as to permit coupling of bridge sections at the same height with respect to said laying device, the improvement wherein

said pick-up device has means for supporting a plurality of the bridge sections when said plurality of the bridge sections are in a coupled state, such that the plurality of coupled bridge sections are displaceable relative to said supporting means away from the laying device in the longitudinal direction; and

said pick-up device is spaced from said laying device in the longitudinal direction a distance which is dimensioned so that at least one bridge section can be inserted between bridge sections supported by said laying device and said pick-up device.

5,179,752

COVER FOR TRENCHES

Peter S. Clough, Stretford; Richard J. Yeowart, Aylesbury, and Mansel Moore, Rutland, all of United Kingdom, assignors to British Gas plc, United Kingdom

Continuation of Ser. No. 619,836, Nov. 30, 1990. This application May 14, 1992, Ser. No. 884,059

Claims priority, application United Kingdom, Dec. 4, 1989, 8927346

Int. Cl.[5] E01D *19/12*

U.S. Cl. 14—73 **13 Claims**

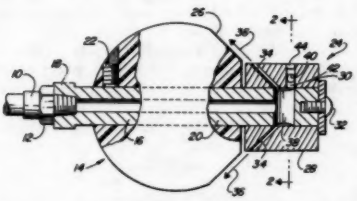
1. A cover for temporarily covering a trench comprising a cover member, said cover member having a central portion and, at each of two opposite sides thereof, respective lateral edge portions each extending along the length of the cover member and each having a lateral edge extending along a side thereof remote from said central portion, said cover having first and second opposite ends each extending transversely to said lateral edge portions and extending across the cover from one said lateral edge to said other lateral edge, a first lug depending from said first end and having a width dimension along the transverse direction of said cover at said first end such that said first lug has two spaced depending opposite edges each set back towards the middle of said first end from a proximate said lateral edge, a second lug depending from said second end and having a width dimension along the transverse direction of said cover less than the transverse dimension of said cover at said second end such that said second lug has two spaced depending edges each set back towards the middle of said second end from a proximate said lateral edge, said set back edges allowing the cover, in use, to be placed over a trench having a width at least equal to the width dimension of said second lug but less than the transverse dimension of the cover from one lateral edge to the other lateral edge so that the first and second lugs both extend into said trench and allow said lateral edge portions to rest on the ground on opposite sides respectively of the trench over which said cover extends, said first lug providing a male latching member, said second lug having an aperture therethrough and providing a female latching member such that said male latching member on a said cover can be fitted removably into the aperture of the female latching member of another said cover adjacent thereto and engage that female latching member when fitted into the aperture thereof, and said cover being releasably engageable by means of the male latching member of said cover engaging the female latching member of an adjacent said cover in such a manner that when the covers have the lugs thereof in the trench and the lateral edge portions thereof resting on the ground to form an assembly of said cover and the adjacent cover, one said cover of the assembly can be disengaged from

the other said cover by moving a said cover out of a general plane of the assembly.

5,179,753
JET THRUSTER WITH SPINNER HEAD

William J. Flaherty, and Matthew J. Flaherty, both of 2536 East St., Davenport, Iowa 52803

Continuation-in-part of Ser. No. 758,132, Sep. 12, 1991, abandoned. This application Feb. 21, 1992, Ser. No. 838,998
Int. Cl.[5] B08B *9/02*
U.S. Cl. 15—104.12 **20 Claims**

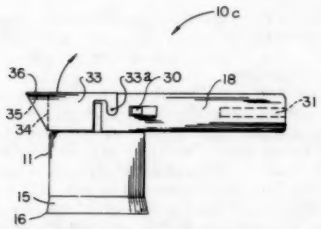


1. A jet thruster for attachment to the front end of a high-liquid-pressure hose, comprising a body providing substantially a coaxial forward prolongation of the hose, said body having a coaxially forward extension means provided with a coaxial cylindrical bearing surface, said body and extension means including fore-and-aft passage means therethrough for communicative connection to the outlet end of the hose, a spinner head- rotatable on the cylindrical bearing surface, first jet means in communication with the aforesaid passage means and contained at least in part in the spinner head and exiting rearwardly and radially outwardly to direct liquid under pressure over the body so as to create a thrust force tending to advance the body and second jet means in the spinner head and in communication with the passage means and extending in non radial relation to the spinner head and exiting outwardly in such manner as to create a side thrust tending to rotate the spinner head.

5,179,754
ICE SCRAPER APPARATUS

Loran J. Stradnick, R.D. #2, Box 180-B, Wapwallopen, Pa. 18660

Filed Jan. 27, 1992, Ser. No. 826,050
Int. Cl.[5] A47L *13/02*
U.S. Cl. 15—105 **1 Claim**



1. An ice scraper apparatus, comprising,

a cylindrical housing, the cylindrical housing defined about a housing axis, and a top wall fixedly mounted to an upper distal end of the cylindrical housing orthogonally oriented relative to the housing axis, and

the cylindrical housing including a conical housing lower skirt portion extending exteriorly of the cylindrical housing and coaxially oriented about the housing axis, and

the skirt including a circular scraping edge positioned within a predetermined plane, the predetermined plane oriented orthogonally relative to the housing axis and the circular scraping edge defining a lower edge of the lower skirt, and

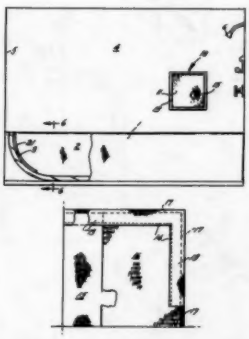
the top wall has attached thereto grasping means projecting above the top wall for manual grasping in ease of maneuverability of the cylindrical housing, and

the grasping means includes a handle member fixedly mounted to the top wall, the handle member including an illumination housing pivotally mounted to a forward distal end of the handle about an axle, the axle oriented parallel relative to the housing top wall, and the illumination housing including a housing flange projecting radially beyond the cylindrical housing, and a transparent lens mounted within a forward end of the housing below the flange, and a mirror mounted in contiguous communication to the flange orthogonally intersecting the transparent lens, and a battery mounted within the handle, and a switch member mounted within the handle, and an illumination bulb mounted within the illumination housing adjacent the transparent lens, wherein the switch, the battery, and the illumination bulb are in electrical communication with one another permitting selective actuation of the illumination bulb by the switch with the mirror arranged to reflect illumination from the illumination bulb downwardly relative to the housing flange.

5,179,755
BACK SCRUBBER MAT

Samuel B. Hill, Jr., P.O. Box 24034, Eugene, Oreg. 97402

Filed Jan. 3, 1992, Ser. No. 816,575
Int. Cl.[5] A46B *15/00*
U.S. Cl. 15—160 **4 Claims**



1. A back scrubber for installation on a wall surface, said back scrubber comprising,

a piece of carpeting having tuffs of synthetic non-absorbent fibrous material to provide a rough yieldable surface against which a user may move his or her back, said carpeting having a backing of synthetic material to withstand repeated exposure to water,

fabric closure pieces of the hook and loop type, first closure pieces having an adhesive surface for attachment to the wall surface,

a fabric tape extending about the perimeter of said backing,

second closure pieces having edges disposed intermediate said tape and said backing and engageable with said first closure pieces for attachment of the back scrubber to a wall surface, and

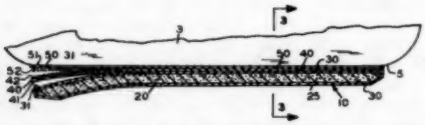
stitching passing through said backing and said fabric tape and said second closure pieces to attach the second closure pieces to said backing in a reinforced manner to prevent accidental separation from the backing.

5,179,756

MAGNETIC PICK UP BAR FOR VACUUM CLEANERS

David W. Korsen, 6053 Corporal La., Boise, Id. 83704

Filed Oct. 15, 1991, Ser. No. 776,218
Int. Cl.[5] A47L 9/00; B03C 1/30
U.S. Cl. 15—246 8 Claims



1. A magnetic pick up device for a vacuum cleaner comprising:

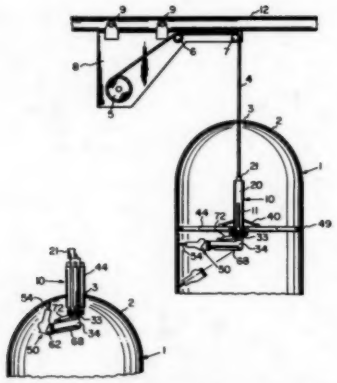
an elongated bar having a body portion constructed of flexible magnetized material to prevent deforming of objects with which it may make contact; and having a flexible covering of mark-resistant material to prevent discoloring of objects with which said bar makes contact.

5,179,757

APPARATUS FOR DESCALING A PROCESS VESSEL

Louis A. Grant, Jr., Pittsburgh, Pa., assignor to Louis A. Grant, Inc., Pittsburgh, Pa.

Filed Mar. 23, 1992, Ser. No. 855,524
Int. Cl.[5] F22B 37/48
U.S. Cl. 15—246.5 9 Claims



1. Cleaning apparatus for removing deposits from the inner surface of the wall of a vessel having a vertical longitudinal axis and a dome at the upper end with an access opening therein, said apparatus comprising:

a) an elongated support column having an upper end and a lower end,

b) means at the upper end of said support column adapted to be attached to an end of a cable extending through the access opening and connected to a movable rigging located exteriorly of the vessel to adjustably position said support column within said vessel along the vertical longitudinal axis of the vessel,

c) a hammer assembly having a reciprocating hammer with a removable bit,

d) means for pivotally and rotatably attaching said hammer assembly to the lower end of said support column,

e) a plurality of cylinders having a first end pivotally connected adjacent the lower end of said support column and including adjustable contact means on a second end for frictionally engaging the inner surface of the wall of the vessel to position said hammer assembly horizontally within the vessel,

f) means for pivoting each of said cylinders between a first position substantially parallel to the longitudinal axis of said elongated support column and a second position substantially perpendicular to the longitudinal axis of said elongated support column,

g) means for rotating said hammer assembly about the longitudinal axis of said elongated support column to position said bit for contact with the inner surface of the vessel wall,

h) means for pivoting said hammer assembly relative to the longitudinal axis of said elongated support column to angularly position said bit for contact with the inner surface of the vessel wall, and

i) means for sliding said hammer assembly relative to the longitudinally axis of said elongated support column to laterally position said bit for contact with the inner surface of the vessel wall,

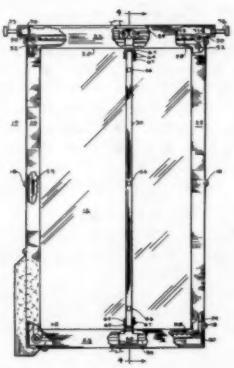
whereby said bit is adjustable to contact the complete inner surface of the vessel wall.

5,179,758

WIPER ATTACHMENT FOR REAR VIEW MIRRORS

Darrel L. Smith, 4012 E. Louisiana Ave., and Donnie Knight, 4014 E. Louisiana Ave., both of, Tampa, Fla. 33610

Filed Dec. 4, 1991, Ser. No. 802,316
Int. Cl.[5] B60S 1/20, 1/26, 1/44, 1/56
U.S. Cl. 15—250.003 17 Claims



1. An exterior rear view mirror wiper accessory adapted for use with an exterior rear view mirror on a large commercial vehicle such as a truck, bus, or similar vehicle, said wiper accessory comprising:

(a) a frame, said frame having top, bottom, left, and right side members, a centrally disposed substantially rectangular opening for exposing the mirror to view, mounting means for mounting said frame on an existing rear view mirror of said vehicle, and a pair of runner tracks, one of said runner tracks being located in each of two opposite side members and said pair of runner tracks being parallel;

(b) a pair of runner assemblies, one said runner assembly slidably attached to each said runner track;

(c) a wiper assembly, said wiper assembly including a flexible wiper blade or squeegee for wiping said mirror and backing means for delivering substantially even pressure along said flexible wiper blade against said mirror, said flexible wiper blade being attached to said backing means and said backing means having two opposite ends, and each said opposite end of said backing means being mounted to one of said runner assemblies;

(d) a plurality of pulleys and a cable threaded around said

pulleys, said cable being attached to said runner assemblies for constraining said runner assemblies to move synchronously back and forth along said runner tracks according to said cable's movements;

(e) a bidirectional motor;

(f) drive pulley means for urging said cable to move responsive to said bidirectional motor;

(g) power source means for applying electric power to said bidirectional motor;

(h) power control means for periodically reversing the polarity of said electric power applied to said bidirectional motor; and

(i) detection means for detecting the presence of said wiper assembly at each of two opposing extreme positions along said mirror and for stopping further travel of said wiper assembly beyond said opposing extreme positions by removing electric power from said bidirectional motor until the polarity of said electric power is reversed.

5,179,759

DRIVE MECHANISM WITH LOST MOTION PLAY FOR A WINDSHIELD WIPER DEVICE OF MOTOR VEHICLES

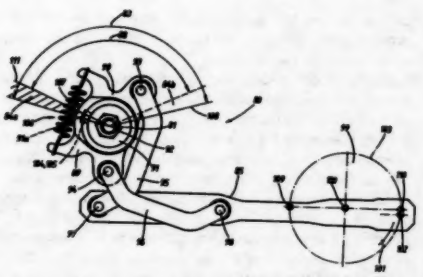
Anton Epple, Rottenburg; Hans Trube, Herrenberg, and Martin Pfeiffer, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 8, 1990, Ser. No. 478,459

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1989, 3903681

Int. Cl.[5] B60S *1/06*

U.S. Cl. 15—250.13 **6 Claims**



1. Drive mechanism for a motor vehicle windshield wiper arrangement, comprising:

a rotatable crank;

at least one wiper shaft for mounting an associated windshield wiper arm;

two articulated levers operatively connected with said wiper arm, said articulated levers forming a crosslink;

a drive rod operatively connecting the articulated levers with the drank to which the drive rod is firmly coupled; and

obstruction means operatively connected to the wiper shaft for allowing an unimpeded movement of the crank when the wiper arm is obstructed, the obstruction means including:

a pair of drive levers, each operatively coupled to a separate one of said articulated levers, each of the drive levers being rotationally movable on the wiper shaft to act as rockers and

a recess in each drive lever into which a driving dog operatively connected to the wiper shaft is adapted to engage, each said recess providing for a lost motion movement between respective drive levers and the driving dog;

whereby restraint of one of the two drive levers provides a lost motion play with the driving dog such that if movement of the windshield wiper arm is obstructed, movement of the drive rod is still permitted, independently of the wiper speed and windshield wetting.

5,179,760

APPARATUS FOR CHANGING WIPING RANGE OF WIPER

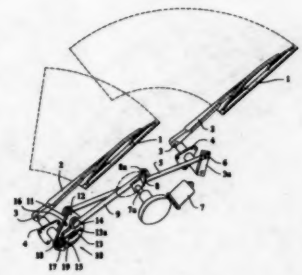
Jun Abe, Ashikaga, Japan, assignor to Mitsuba Electric Manufacturing Co., Ltd., Gunma, Japan

Filed Dec. 21, 1990, Ser. No. 631,423

Claims priority, application Japan, Dec. 29, 1989, 1-342592

Int. Cl.[5] B60S *1/06*

U.S. Cl. 15—250.13 **16 Claims**



1. A link movement conversion mechanism for changing a back and forth wiping range of a window wiper blade mounted on one end of a wiper arm, said wiper arm mounted at an opposite end to a rotatable wiper shaft, said link movement conversion mechanism converting back and forth movement of a drive link driven by a rotating motor into a back and forth sweeping oscillation over the wiping range of the wiper blade, comprising:

a first link integrally fixed to the wiper shaft proximate an end opposite that end to which the wiper arm is mounted;

a second link pivotally mounted to said first link, the drive link driven by the motor pivotally attached to said second link;

an auxiliary link pivotally provided on said first link at a pivot point away from the pivot mount of said second link; a first and a second stop means on said first link for establishing a first and a second link position for said second link which adjust one end of the wiping range; and

a tension means for retaining said second link in one of said first and said second link positions, said tension means attached at a first end to said second link and at a second end to said auxiliary link, an edge of said second link and an edge of said auxiliary link being engaged such that rotation of one rotates the other and said tension means retains said second link and said auxiliary link in position when said second link abuts one of said first and second stop means.

5,179,761

AERODYNAMIC WINDSHIELD WIPER SUPERSTRUCTURE

Franz Buechele, and Stephen G. Dipple, both of Ontario, Canada, assignors to Tridon Limited, Burlington, Canada

Filed Oct. 19, 1990, Ser. No. 599,936

Int. Cl.[5] B60S *1/04*

U.S. Cl. 15—250.42 **3 Claims**

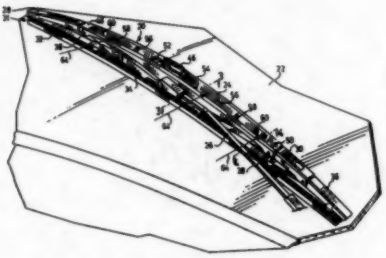
1. A windshield wiper assembly comprising a superstructure and a squeegee positioned below and connected to the superstructure in an operative orientation for wiping a windshield, the superstructure being adapted for connection to a wiper arm driven to reciprocate the superstructure over a windshield with and against a natural prevailing air flow over said windshield, and including a longitudinally extending primary yoke, the primary yoke comprising:

a synthetic plastic molding having transversely spaced leeward and windward sides relative to said air flow, said sides having a predetermined separation between opposed inner surfaces thereof which increases from a minimum at

an operative bottom side of the yoke to a maximum at an operative top side of the yoke remote from the windshield;

a gap defined between said inner surfaces extending through said primary yoke between the bottom and top sides thereof through which air may pass;

said leeward and windward sides having a smoothly rounded profile at the top and bottom, thereby minimizing any turbulence which may be created when said air flow impinges on the primary yoke; and



the leeward side extending upwardly above the windshield by a distance defining the effective height of the leeward side, the windward side similarly extending upwardly above the windshield by a distance defining the effective height of the windward side, said effective height of the leeward side exceeding the effective height of the windward side for at least a portion of the length of the yoke so that the leeward side is exposed to air flowing across the yoke over the windward side on said portion, and the assembly is pushed against the windshield.

5,179,762

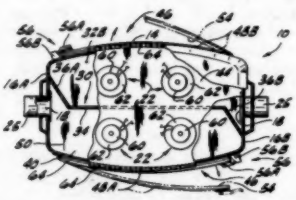
VACUUM CLEANER

Donald Wisnasky, Eureka, Mo., assignor to D & S Manufacturing Co., High Ridge, Mo.

Filed Jul. 15, 1991, Ser. No. 729,615

Int. Cl.[5] A47L *5/38*

U.S. Cl. 15—314 **9 Claims**



1. A vacuum cleaner comprising a housing enclosing a volume, the housing having a front and a rear and laterally opposite sides, an opening in each side of the housing permitting communication with the interior of the housing, each opening being generally located intermediate the front and rear of the housing, a partition located inside the housing dividing at least a portion of the volume enclosed by the housing into two chambers of substantially equal volume, the chambers being substantially sealed from one another, vacuum pump means adapted to create a vacuum in the chambers relative to ambient, the partition being constructed and arranged so that the opening in a first of the sides of the housing communicates solely with a first of the chambers, and an opening in a second of the sides communicates solely with a second of the chambers.

5,179,763

METHOD AND APPARATUS FOR OPENING FIBER BALES ALONG AN INCLINED PLANE

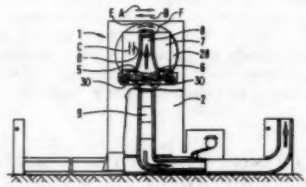
Johann Zander, Mönchengladbach, and Josef Temburg, Jüchen, both of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Dec. 13, 1991, Ser. No. 806,250

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1990, 4040197

Int. Cl.[5] D01G *7/06*

U.S. Cl. 19—80 R **17 Claims**



1. In a method of detaching fiber tufts from a top surface of serially-arranged fiber bales by a bale opener having a supporting structure and a detaching device mounted on the supporting structure, including the steps of

propelling the bale opener for back-and-forth travel along the fiber bale series,

simultaneously with the propelling step, vertically moving the detaching device relative to the supporting structure and

simultaneously with the propelling step and the vertically moving step, removing fiber tufts by the detaching device in consecutive passes;

the improvement comprising the following steps in each consecutive pass during run-in phase in which the surface of the bale series is changed from a substantially horizontal orientation to a predetermined oblique orientation for normal detaching operation and during a run-out phase in which the surface of the bale series is changed from an oblique orientation to a substantially horizontal orientation:

(a) forming a new surface of the bale series; said new surface having an inclination to the horizontal that is different from the inclination of a series surface formed during an immediately preceding pass; and

(b) varying the velocity of travel of the bale opener structure during each pass.

5,179,764

CLEANING BELTS FOR THE DRAFTING MECHANISM OF A SPINNING MACHINE

Takashi Iwade, Kyoto, and Kosei Nagata, Moriyama, both of Japan, assignors to Toray Engineering Co., Ltd., Osaka, Japan

Filed Jul. 25, 1991, Ser. No. 735,806

Claims priority, application Japan, Jun. 3, 1991, 3-159615

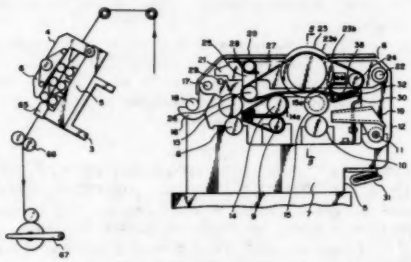
Int. Cl.[5] D01H *5/64*

U.S. Cl. 19—245 **17 Claims**

1. A cleaner for a spinning machine including a plurality of drafting mechanisms arranged at predetermined intervals in a longitudinal direction of a machine frame, each drafting mechanism having a cleaning belt which contacts at least one drafting roller, said cleaner comprising:

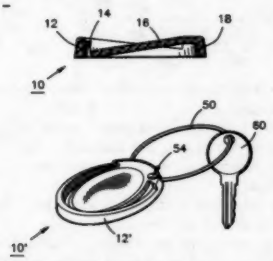
a transporting belt in contact with each of said cleaning belts

for scratching off fiber dust and lint adhering to said cleaning belts and for transporting the scratched-off fiber



dust and lint in the longitudinal direction of the machine frame.

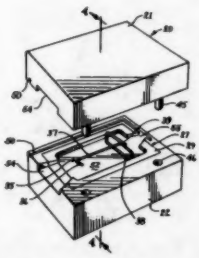
5,179,765
PLASTIC PAPER CLIP
Carl B. Sungberg, 179 Reimers Rd., Monson, Mass. 01057
Filed Jan. 8, 1992, Ser. No. 818,147
Int. Cl.[5] B43F *1/02*
U.S. Cl. 24—67.9 **5 Claims**



1. A plastic paper clip, comprising:
(a) a generally flat, horizontal, relatively rigid, base gripping member, having a tapered planar paper engaging upper surface and a flat lower surface, and having an opening defined therein;
(b) a generally flat, generally horizontal, relatively rigid, upper gripping member fitable within said opening and having upper and lower surfaces, the proximal end of said upper gripping member being attached to said lower gripped member by a vertical joining member such that said proximal end of said upper gripping member and said lower gripping member are spaced apart at a C-shaped throat formed therebetween; and
(c) the distal end of said upper gripping member being inclined into said base gripping member such that said lower surface of said upper gripping member at the distal end thereof lies substantially in the plane of said lower surface of said base member when said paper clip is not in use.

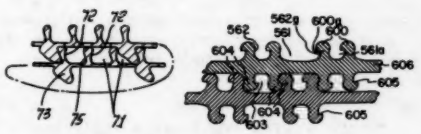
5,179,766
BELT BUCKLE
Ronald C. Matusek, 12908 N. 72nd Ave., Peoria, Ariz. 85381
Filed Dec. 31, 1991, Ser. No. 815,418
Int. Cl.[5] A44B *11/00*
U.S. Cl. 24—163 K **6 Claims**

1. A belt buckle comprising:
(a) a rigid frame member having a loop formed at one end thereof to receive a belt, a hook for insertion into holes provided therefor in a belt, and an intermediate portion rigidly and permanently connecting said loop and said hook;
(b) a solidified plastic material encasing said frame member with said loop and said hook exposed to permit the attachment of said belt to said loop and permit said hook to be inserted in holes provided in said belt;
(c) said solidified plastic material including an outer face for receiving a decorative pattern; and



(d) said hook and said loop extending from and exposed on a face of said solidified plastic material opposite to said outer face.

5,179,767
CONNECTOR APPARATUS
Robert M. Allan, 1631 Colgate Cir., La Jolla, Calif. 92037
Continuation-in-part of Ser. No. 553,258, Jul. 16, 1990, Pat. No. 5,088,162. This application Nov. 12, 1991, Ser. No. 787,424
The portion of the term of this patent subsequent to Feb. 18, 2009, has been disclaimed.
Int. Cl.[5] A44B *18/00*
U.S. Cl. 24—442 **39 Claims**



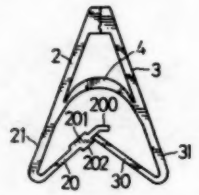
1. A connector comprising
a) a body having generally flexible, C-shaped cross section means defining recess means in planes crosswise of and normal to a major dimension of said body,
b) said body having a base and a succession of side walls together defining said C-shaped recess means, each side wall having a mid-section and an outer side wall portion, said mid-section being widthwise narrower than said outer side wall portion and sufficiently narrow to allow said outer side wall portion to flex, relative to said mid-section,
c) said side walls having inverted and rounded C-shaped termini relative to said C-shaped recess means,
d) and a ridge means configured to flexibly fit in and be gripped by the side walls of certain of said recess means, said ridge means fitting against said narrowed mid-sections, and a web integral with said ridge means and extending across said outer side wall portions,
e) said ridge means being fitted in said certain C-shaped recess means to form said connector,
f) and including means to confirm complete adjusted interlock of said ridge means in said certain C-shaped recess means,
g) said recess means including C-shaped recesses and said ridge means including ridges, wherein certain C-shaped recesses are configured to each nest a single ridge, and wherein other C-shaped recesses are configured to nest a plurality of ridges.

5,179,768

CLOTHESPIN

Chain-Fou Jio, No. 33, Kai-Yuan Road, Tainan City, Taiwan

Filed Aug. 17, 1992, Ser. No. 930,355
Int. Cl.[5] A44B *21/00*
U.S. Cl. 24—545 **1 Claim**



1. A clothespin made of plastic as one unit, comprising;

two opposite pin plates having teeth on upper inner portions for pinching clothes, an elastic plate extending bendingly inward from a bottom end of each pin plate, a slightly bending stopper formed at the end of one of the elastic plates, a projection on and under the same elastic plates near the end stopper;

an elastic curved-up bridge formed between intermediate portions of said two pin plates to supply elasticity to recover said pin plates its original closed position after lower portions of said pin plates are pressed inward to force open the upper toothed portions for pinching clothes; and

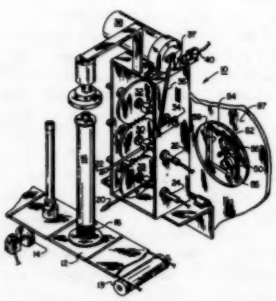
said elastic plate with the stopper and the two projections being pressed upward or inward to let the top of the other elastic plate push and support the upper end of the lower projection of said elastic plate at its place so that said two elastic plates may also have elasticity to recover their position after pressed inward by the lower portions of the pin plates, in addition to that of said elastic bridge, so as to always keep the upper toothed portions of said pin plates tensely closed up for pinching clothes between them.

5,179,769

VISION SYSTEM FOR BOBBIN STRIPPING

John H. Ferguson, Sr., P.O. Box 116, Linwood, N.C. 27299, and James D. Heiss, Lexington, N.C., assignors to John H. Ferguson, Sr., Linwood, N.C.

Filed Sep. 18, 1991, Ser. No. 761,726
Int. Cl.[5] B65H *73/00*
U.S. Cl. 28—292 **37 Claims**



35. A method of automating a process of stripping fibers from bobbins with water jets which scatters vision-obscuring by-products comprising

carrying out the bobbin stripping process and thereby scattering vision obscuring by-products,

viewing the bobbin stripping process from a viewing location as it is carried out,

controlling the bobbin stripping process in response to data about the bobbin stripping process received in said viewing step, and

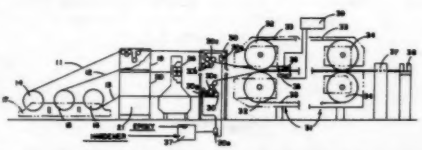
rotating a transparent shield between the bobbin stripping process and the viewing location to centrifugally throw off by-products onto the shield, to provide a clear, shielded view of the bobbin stripping process.

5,179,770

MACHINE AND METHOD FOR FABRICATING A SHEET METAL STRUCTURE HAVING A CORRUGATED CORE

James P. Block, Valley Center; Stanley W. Levasheff, Huntington Beach, and Gordon G. Jarosek, Westminster, all of Calif., assignors to LCOA Laminating Company of America, Garden Grove, Calif.

Division of Ser. No. 471,844, Jan. 26, 1990, abandoned. This application Jan. 2, 1992, Ser. No. 815,854
Int. Cl.[5] B21D *33/00, 13/04*
U.S. Cl. 29—17.3 **8 Claims**



6. A method for fabricating a sheet metal sandwich structure having a corrugated core from three metal foils comprising:

feeding said foils in spaced apart opposing relationship to each other, one of said foils forming a central foil which is positioned between the other two of said foils which form outer foils,

tensioning said foils to maintain them in a flat uncrinkled condition as they are being fed,

feeding the central foil between a pair of opposing corrugator tools, corrugations thereby being formed therein, said corrugator tools, being supported in a floating condition between a plurality of surrounding drive gears which rotatably drive the corrugator tools,

applying adhesive to the inner surfaces of said outer foils,

uniformly heating the cylindrical surfaces of a pair of opposing cylindrical drums,

feeding said foils between the cylindrical surfaces of said drums with the central foil sandwiched between the outer foils, said foils being pressed together by said drums and uniformly heated thereby to cure the adhesive,

applying uniform pressure over the entire surfaces of the outer foils to effect the joinder thereof with the central corrugated foil to form an integral structure, and

cutting said integral structure into sheets of a predetermined size.

5,179,771

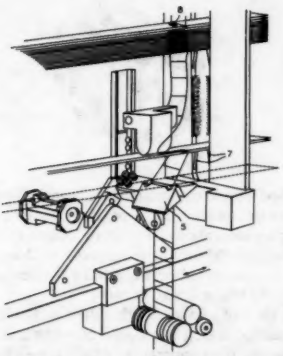
APPARATUS FOR ASSEMBLING SLATS OF VENETIAN BLINDS

Jens O. Hebsgaard, Odense, Denmark, assignor to A/S Chr. Fabers Fabriker, Ryslinge, Denmark

Filed Oct. 25, 1991, Ser. No. 768,628
Claims priority, application Denmark, Apr. 25, 1989, 1992/89
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—24.5 **2 Claims**

1. A machine for production of finished lath packs for Venetian lath blinds, the superjacent laths (2, 2') of which have punched holes (8) at least at the ends for draw cords and ladders (3) consisting of bands or strings, every cross band of which carries a lath, and where one of two neighboring cross bands of a ladder is placed on one side while the other is placed

on the other side of a draw cord passed through the punched holes (8), which machine has a feed mechanism which inserts laths (2) one by one over a cross band in a suspended ladder (3) and at each of the suspended ladders a lifting mechanism (1) which lifts the inserted lath and the ladder (3) so that a following lath is inserted over a following cross band of the ladder, the machine also having devices to retain the raised lath, characterized in that each lifting mechanism has a carrier (1) with a slit through which the suspended ladder (3) stretches and, on



opposite sides of the slit, oppositely inclined carrier faces (5) for engaging an inserted lath (2), which carrier can turn on an axis (6) stretching across the lower side of the inserted lath between one end position where one carrier face supports the lath and another end position where the other carrier face supports the lath, the machine also having a mechanism (9–12) to swing the carrier (1) from the one end position to the other end position synchronously with movement of the feed mechanism.

5,179,772

APPARATUS FOR REMOVING BURRS FROM METALLIC WORKPIECES

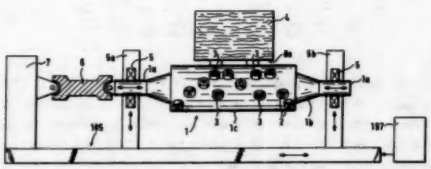
E. Braun, and Jürgen Wojciechowski, both of Dillingen, Fed. Rep. of Germany, assignors to PLAKOMA Planungen und Konstruktionen von maschinellen Einrichtungen GmbH, Dillingen, Fed. Rep. of Germany

Filed Apr. 26, 1991, Ser. No. 692,281

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1990, 4034466

Int. Cl.[5] B23D *1/22*

U.S. Cl. 29—81.05 **15 Claims**



1. Apparatus for removing burrs from semifinished metallic products following a flame cutting treatment, comprising a rotary shaft having a peripheral surface; means for rotating said shaft; a plurality of burr removing tools provided at and extending from the peripheral surface of said shaft; means for non-movably securing at least one of said cutting tools to said shaft; and product transporting elements at the peripheral surface of said shaft.

5,179,773

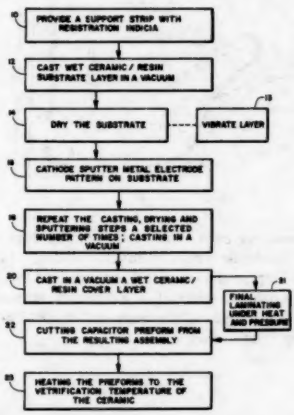
PROCESS OF MANUFACTURING MULTILAYER CERAMIC CAPACITORS

John C. Monsees, Boulder, Colo.; Joseph W. Crownover, La Jolla, and Aubrey M. Burer, El Cajon, both of Calif., assignors to BMC Technology Corporation, San Diego, Calif.

Filed Aug. 30, 1991, Ser. No. 753,070

Int. Cl.[5] H01G *4/10*

U.S. Cl. 29—25.42 **22 Claims**


PROVIDE A SUPPORT STRIP WITH REGISTRATION INDICIA
CAST WET CERAMIC / RESIN SUBSTRATE LAYER IN A VACUUM
DRY THE SUBSTRATE
VIBRATE LAYER
CATHODE SPUTTER METAL ELECTRODE PATTERN ON SUBSTRATE
REPEAT THE CASTING, DRYING AND SPUTTERING STEPS A SELECTED NUMBER OF TIMES ; CASTING IN A VACUUM
CAST IN A VACUUM A WET CERAMIC / RESIN COVER LAYER
FINAL LAMINATING UNDER HEAT AND PRESSURE
CUTTING CAPACITOR PREFORM FROM THE RESULTING ASSEMBLY
HEATING THE PREFORMS TO THE VETRIFICATION TEMPERATURE OF THE CERAMIC

1. The process of making thin monolithic multiplayer capacitors which comprises the steps of:

providing a support strip bearing registration indicia;

casting a substrate layer on said support strip from a mixture of finely divided ceramic particles in a wet resin and solvent matrix;

drying said substrate layer;

forming selected electrode patterns by cathode sputtering through a stencil in accordance with said indicia;

repeating said casting, drying and sputtering steps at least one additional time; and

casting a cover layer of ceramic particles in a wet resin and solvent matrix over the final sputtering step.

5,179,774

APPARATUS AND METHOD FOR MECHANICALLY APPLYING A SEALING STRIP

Stephen P. Massie, South Woodham Ferrers, England, assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 705,237, May 24, 1991, Pat. No. 5,121,532.

This application Apr. 13, 1992, Ser. No. 867,957

Claims priority, application United Kingdom, May 24, 1990, 9011608

Int. Cl.[5] B23P *11/02*

U.S. Cl. 29—451 **3 Claims**

1. A method for mechanically fitting a channel-shaped sealing strip to a peripheral lip circumferentially surrounding an opening of an automotive vehicle, comprising the steps of:

providing an open-ended, fixed length of sealing strip to a means for mechanically fitting said strip to said lip;

guiding said strip through said means to form an open loop of said sealing strip, said loop having a configuration generally similar to the configuration of said opening, each end of said loop being free;

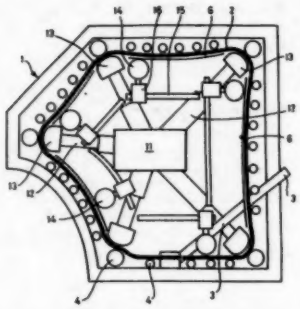
gripping said free ends of said loop and indenting said ends radially inwardly from the plane of said loop;

moving said loop of sealing strip into alignment with said lip of said vehicle opening;

applying a radially acting force against said strip to press

said loop onto said lip at a plurality of predefined locations;

applying a radially acting force against said strip between said predefined locations so that said strip engages said lip;



moving said free ends of said loop radially outwardly along generally identical arcs of travel with respect to the plane of said loop so that said ends engage said lip; and

applying a force to said ends in a direction normal to said lip so that said ends axially engage said lip and one another in abutting relationship.

5,179,775

SYSTEM FOR FINISHING CONDUCTOR BUNDLES

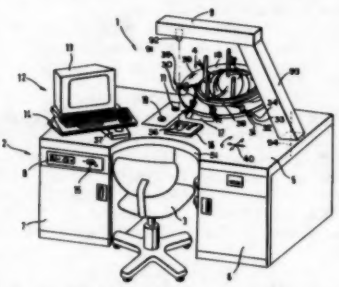
Hans Bogotzek, Nottensdorf; Hans-Peter Mairose, Borstel, and Erich Orth, Hamburg, all of Fed. Rep. of Germany, assignors to Deutsche Airbus GmbH, Hamburg, Fed. Rep. of Germany

Filed Jan. 10, 1992, Ser. No. 819,459

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1991, 4100797

Int. Cl.[5] H01R *43/04*

U.S. Cl. 29—564.4 **15 Claims**



1. A system for finishing a conductor wire harness, comprising at least one work station for an operator, said work station including work performing means for securing contact elements to ends of conductors in a bundle and means for inserting secured contact elements into a connector member, and a harness carrier for holding at least one conductor harness, said harness carrier comprising a platform for supporting a conductor harness, and movable support means on which said platform means is mounted in a rotatable manner and for transporting said platform along a floor into a position for cooperation with said work station, said work station comprising a recess into which said support means are movable for bringing said platform into said position for cooperation with said work performing means of said work station.

5,179,776

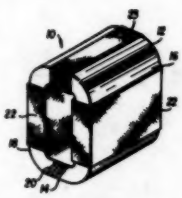
METHOD OF RESTRAINING AN AMORPHOUS METAL CORE

Maurice J. Boenitz, Lenox, Mass., and Harry T. Denner, Waukesha, Wis., assignors to Cooper Power Systems, Inc., Corsopolis, Pa.

Filed Mar. 26, 1991, Ser. No. 674,885

Int. Cl.[5] H01F *41/02*

U.S. Cl. 29—609 **12 Claims**



1. A method of making an amorphous metal core for use in a transformer comprising the steps of:

providing an amorphous metal core formed from a stack of amorphous metal laminations, said core having two legs which are connected by a top and a bottom yoke, each of said legs having a linear portion;

wrapping each of said legs with a sheet of flexible, non-metallic material which is capable of withstanding, without degradation, the temperature which is required to anneal the amorphous metal laminations, said wrapping step further comprising wrapping the entire linear portion of each of said legs with said sheet material; and

after said wrapping step, heating the wrapped metal core to a temperature which is sufficient to anneal the amorphous metal laminations.

5,179,777

METHOD OF MAKING MULTILAYER PRINTED WIRING BOARDS

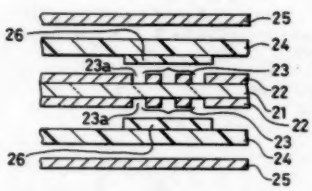
Toshiya Suzuki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Feb. 24, 1992, Ser. No. 840,032

Claims priority, application Japan, Mar. 7, 1991, 3-040401

Int. Cl.[5] H05K *3/10*

U.S. Cl. 29—848 **5 Claims**



1. A method of making a multilayer printed wiring board including an internal plate having a patterned conductive layer formed on at least one surface of an insulating material and an external plate laminatedly formed via a sheet-like prepreg on the internal plate, comprising;

a first step of preparing a filler material to be filled into a clearance of said conductive layer;

a second step of disposing said filler material between said internal plate and said prepreg so as to correspond respectively to said clearance of said conductive layer; and

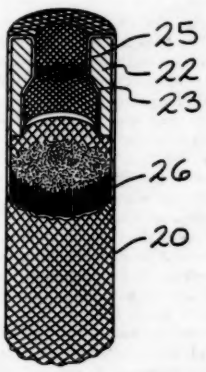
a third step of laminating said internal plate via said prepreg and said filler material with said external plate thereby to be adhered integrally to each other.

5,179,778

METHOD AND MEANS FOR PRODUCING DISKS OF TIGHTLY PACKED ON-END ALIGNED FIBERS

Lawrence J. Dickson, 558 Cedar Run Rd., Newark, and Donald L. Blake, 4489 Newton Rd., NE. Newark, both of Ohio 43055

Filed Feb. 25, 1992, Ser. No. 842,029
Int. Cl.[5] H01R *43/20;* B23P *23/04*
U.S. Cl. 29—876 21 Claims



1. The method of producing a tube containing a densely compact mass of side-by-side filaments adaptable to being cut cross-wise into disks comprising

surrounding a multiplicity loosely grouped side-by-side filaments with a gripping sleeve of type which under tension tightens about and compacts said filaments,

tensioning said gripping means by pulling the assembly of said sleeve and surrounded multiplicity of filaments tightly into a tube of less internal cross sectional dimension than said loose assembly,

applying a continuous nonrupturing pulling force to said assembly adequate to progressively slide said assembly into one end of said tube, and

removing loose sleeve portions and filaments from opposite ends of said tube of contained compacted filaments.

13. Apparatus for fabricating a tube containing a compacted mass of side-by-side aligned filaments comprising an elongate tube for receipt of filaments therein,

a strength imparting backup casing with open ends shaped to hold said tube in fixed position,

an annular draw-down die at one end of said casing through which filaments are to be drawn into said tube,

said die having a tapered annular opening therethrough with its smaller dimension substantially matched to the interior diameter of said tube,

a mass of continuous filaments for insertion in side-by-side relation in said tube,

a braided pulling sleeve for surrounding said filaments which is of type which constricts in dimension upon being pulled to an elongate condition,

pulling means for exerting a pulling force on one end of said pulling sleeve with said filaments contained therein into said tube through said draw-down die,

said pulling sleeve and contained filaments being pulled into a position in said tube where said filaments and sleeve portion therein extend through the entire length of said tube,

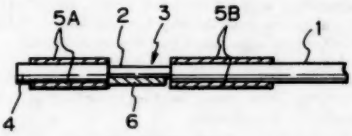
means for severing said sleeve from said pulling means to permit removal of said tube and contained filaments from said casing to provide a tube of highly intensified unbonded filaments aligned in side-by-side relation therein.

5,179,779

METHOD OF FORMING FLAT MULTICORE WIRE

Kazuo Iura; Yoshiaki Yamano, and Kazuhito Saka, all of Mie, Japan, assignors to Sumitomo Wiring Systems Ltd., Mie, Japan

Filed Jul. 11, 1991, Ser. No. 728,503
Claims priority, application Japan, Jul. 13, 1990, 2-186575; Mar. 6, 1991, 3-65386; Mar. 15, 1991, 3-76740; May 20, 1991, 3-143782
Int. Cl.[5] H01R *43/02*
U.S. Cl. 29—877 8 Claims



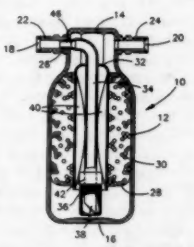
1. A method of forming a flat multicore wire comprising the steps of applying pieces of common coating connecting tape of a slightly short length of the top and bottom surfaces of the coatings at the end portion of a group of round wires, dividing the coatings integrally with said pieces of coating connecting tape that are applied thereon into front and rear half portions, sliding said front half portion forward so as to expose conductors between said front and rear half portions, applying a piece of common conductor connecting tape on the underside of said exposed conductors separately from said piece of coating connecting tape on said rear half portion, and cutting and removing said front half portion so as to allow said exposed conductors to function as a contact portion.

5,179,780

UNIVERSAL SEAMLESS RECEIVER-DEHYDRATOR ASSEMBLY FOR AN AUTOMOTIVE AIR CONDITIONING SYSTEM

Douglas C. Wintersteen, Burt; Lynn R. Hamilton, Lockport, both of N.Y.; Donald E. Mikesell, Dayton, and Gerald R. Sheets, Springfield, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1991, Ser. No. 791,302
Int. Cl.[5] B21D *53/00;* B23P *15/00*
U.S. Cl. 29—890.07 7 Claims



1. A method for seamlessly manufacturing a receiver-dehydrator assembly for an air conditioning system wherein a refrigerant mixture containing refrigerant and oil are circulated therethrough, comprising the following steps:

providing an open-ended canister, said canister having an integrally formed closed end, said closed end having an octagonally-shaped perimeter defining eight surfaces;

attaching an inlet and an outlet 1 each to one of said eight surfaces so as to be in spaced relation to each other, said spaced relation being increments of 45 degrees, said inlet being for receiving the refrigerant mixture and said outlet being for discharging same;

securing a container within said canister, said container containing a desiccant exposed to the interior of said

canister, such that the incoming refrigerant mixture is forced through said desiccant so that said desiccant can effectively adsorb any water entrained therein while allowing the liquid components to pass freely through;

mounting liquid passage means within said canister, said liquid passage means having an inlet disposed so as to receive said liquid components after passing through said desiccant, said liquid passage means being in fluidic communication with and attached to said outlet of said canister so as to recirculate said liquid components of said refrigerant mixture within the air conditioning system; and

friction spin-closing said open end of said canister to form an integral closed end, thereby housing said container and said liquid passage means within said container;

such that said one piece canister is essentially seamless, and said inlet and said outlet of said canister are selectively attachable to any two of said eight surfaces of said octagonally-shaped perimeter.

5,179,781

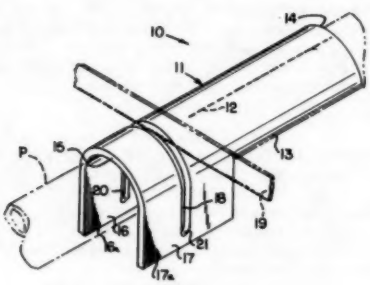
PIPE CUTTING APPARATUS

Roger Weaver, 7471 Berea Rd., Winston, Ga. 30187

Filed Jan. 13, 1992, Ser. No. 819,983

Int. Cl.[5] B23D *21/06*; B26D *3/16*

U.S. Cl. 30—92 **1 Claim**



1. A pipe cutting apparatus, comprising,

a semi-cylindrical support shell, the semi-cylindrical support shell defined by a predetermined diameter and including a first semi-annular end spaced from a generally "U" shaped second end, the support shell including spaced coplanar first and second support shell edges, the support shell is defined by a first length and the first and second support shell edges are defined by a second length less than the first length, wherein the support shell further includes a first and second positioning flange extending in a coplanar parallel relationship relative to one another and extending from the "U" shaped second end to the first and second support shell edges, the first and second positioning flanges terminate in respective first and second free lower ends that are spaced below the respective first and second support shell edges, and

a saw guide slot diametrically directed through the support shell and through the first and second positioning flanges, wherein the saw guide slot terminates in respective first and second slot ends spaced from the second first and second free lower ends of the respective first and second positioning flanges, and a saw blade arranged for reception within the saw guide slots, and

the saw guide slot is orthogonally oriented relative to the first and second support shell edges, and

the saw guide slot includes a rigid continuous slot perimeter guard extending coextensively and in surrounding relationship relative to the saw guide slot, and

a respective first and second hinge coextensive with and parallel to the respective first and second support shell edges and spaced from the first and second support shell edges within the support shell, and a first arcuate engaging flange extends from the first hinge to the first support shell edge, and a second arcuate engaging flange extends from the second hinge to the second support shell edge, and

including a series of spaced parallel engaging ribs fixedly mounted within the semi-cylindrical shell, wherein the ribs are orthogonally oriented relative to the first and second hinges, and the ribs are arranged coextensively between the first support shell edge to the second support shell edge, and

the support shell defines a first central semi-cylindrical segment extending between the first hinge and the second hinge, and further including a second central semi-cylindrical segment longitudinally aligned with the first central semi-cylindrical segment extending from the second end of the support shell, and a third hinge and a fourth hinge are respectively mounted to opposed ends of the second central semi-cylindrical segment, wherein the third hinge is colinear with the first hinge and the fourth hinge is colinear with the second hinge, and the third arcuate engaging flange extends from the third hinge and is hingedly mounted thereto, and a fourth arcuate engaging flange is mounted to the fourth hinge and extends downwardly therefrom, and a first engaging strap secured to the first arcuate engaging flange, a second engaging strap mounted to the second arcuate engaging flange, a third engaging strap mounted to the third arcuate engaging flange, and a fourth arcuate engaging strap mounted to the fourth arcuate engaging flange, and each engaging strap includes a fastener mounted at a free end thereof permitting securement of the first engaging strap to the second engaging strap and the third engaging strap to the fourth engaging strap to permit securement and surrounding relationship relative to a pipe member received within the support shell, and

a reservoir housing mounted to the first central semi-cylindrical segment, the reservoir housing includes a fluid reservoir contained therewithin, and the fluid reservoir includes a fluid conduit in fluid communication with the fluid reservoir, and a fill cap directed through the reservoir housing permitting replenishment of the fluid reservoir with a lubricant fluid, and the fluid reservoir includes a piston floor movably mounted relative to the reservoir housing, the piston floor includes a piston rod, the piston floor fixedly mounted to an upper distal end of the piston rod, and an actuator lever, the actuator lever pivotally mounted to a lower distal end of the piston rod about a second axle, and the reservoir housing including a rear wall, the rear wall including a rear wall opening, and the actuator lever extending through the rear wall opening, and the actuator lever including a first axle pivotally mounting the actuator lever adjacent the rear wall, and the fluid conduit terminates in the conduit spray nozzle, the conduit spray nozzle positioned above and adjacent the saw guide slot and the saw blade to permit projection of the lubricant fluid from the fluid reservoir onto the saw blade during a cutting procedure.

5,179,782

TIRE GROOVER CUTTING HEAD MEMBER HAVING FIXED INSULATOR

Guy A. Van Alstine, 27 W. Cherry Ave., Trappe, Pa. 19426

Continuation-in-part of Ser. No. 812,103, Dec. 23, 1991. This application Feb. 3, 1992, Ser. No. 829,913

Int. Cl.[5] B29D *30/68*

U.S. Cl. 30—140 **9 Claims**

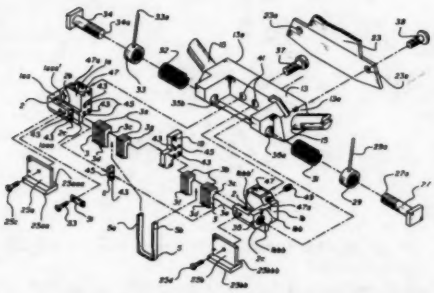
1. An apparatus for cutting a groove in a tire comprising:

a. first floating metal clamping means for engaging a first end of a substantially U-shaped cutting blade against said first floating metal clamping means;

b. second floating metal clamping means for engaging a

second end of said substantially U-shaped cutting blade against said second floating metal clamping means;

c. fixed insulating means for electrically insulating said first floating metal clamping means from said second floating metal clamping means, said fixed insulating means being rigidly interposed between said first and second floating metal clamping means;



d. first tightening means for tightening said first floating metal clamping means and said first end against said fixed insulating means; and

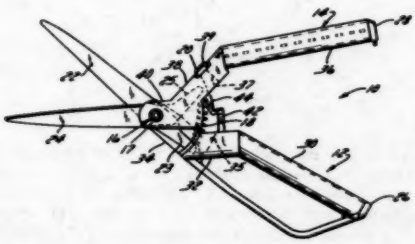
e. second tightening means for tightening said second floating metal clamping means and said second end against said fixed insulating means.

5,179,783

ALL PURPOSE SCISSORS

Craig H. Melter, Baraboo, Wis., assignor to Fiskars OY AB, Helsinki, Finland

Filed Dec. 27, 1991, Ser. No. 815,287
Int. Cl.[5] B26B *13/16*
U.S. Cl. 30—262 **5 Claims**



1. An all purpose pair of scissors comprising:

a first blade assembly including a first handle and a first blade having a tang molded in the first handle,

a second blade assembly including a second handle and a second blade having a tang angularly offset from the second blade and molded in the second handle,

means pivotally connecting said blade assemblies,

said first handle including a first catch and a recess in said first handle adjacent said first catch,

said second handle including a second catch and a recess in said second handle adjacent said second catch,

said first and second handles being so located that on closing said scissors the first catch will be seated in the recess in the second handle and the second catch will be seated in the recess in the first handle,

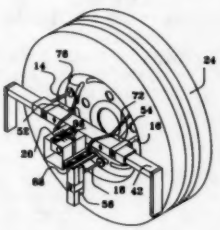
said first catch and said second catch interengaging each other on opening said scissors to limit the distance between the handles whereby the handles can be grasped by one hand when the scissors are open.

5,179,784

WHEEL ALIGNMENT DEVICE

Fred Kowis, 2411 Mary St., Alvin, Tex. 77511

Filed Feb. 10, 1992, Ser. No. 833,136
Int. Cl.[5] G01B *11/275*
U.S. Cl. 33—203.18 **15 Claims**



1. A wheel alignment device comprising:

a frame;

a plurality of abutment members fastened to said frame and extending outwardly therefrom, each of said abutment members having an end opposite said frame which is coplanar with an end of another of said abutment members;

a first bubble level gage affixed to said frame, said first bubble level gage for providing an indication of an inclination of said frame relative to vertical; and

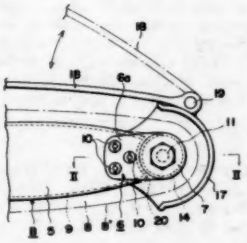
indicator means interactive with said bubble level means, said indicator means for producing a humanly perceivable display of a degree of inclination, said indicator means comprising a second bubble level gage pivotally connected to said frame in proximity to said first bubble level gage, said second bubble level gage having a marker connected thereto, said second bubble level gage and said marker movable so as to provide an indication of angular displacement of said first bubble level gage.

5,179,785

CHAIN SAW GUIDE PLATE

Akira Nagashima, Tokyo, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Feb. 20, 1991, Ser. No. 658,074
Claims priority, application Japan, Feb. 23, 1990, 2-17712[U]
Int. Cl.[5] B23D *57/02, 59/00;* **B27B** *17/00*
U.S. Cl. 30—382 **3 Claims**



1. In a chain saw having a chassis, a guide plate having means about its peripheral edge for guiding a saw chain disposed for running movement over the peripheral edge, and a freely rotating guide roller mounted at the forward tip of said guide plate, the improvement wherein said guide roller is

journalled in a support separate from said guide plate, said support being detachably secured to the forward tip of said plate and being provided with a chain guard extending forwardly therefrom to overlie the nose of said saw chain, and an elongated saw chain cover pivotally mounted at one end on said roller support and extending rearwardly over the top run of said saw chain, said cover being liftable in response to the cutting of a workpiece larger than the transverse dimension of said guide plate.

5,179,786

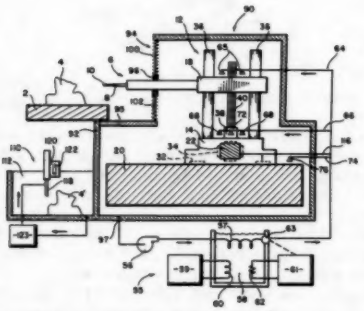
MEASURING APPARATUS WITH TEMPERATURE CONTROL

Russell S. Shelton, 9 Park Ave., Flanders, N.J. 07836

Filed Apr. 22, 1991, Ser. No. 688,432

Int. Cl.[5] G01B *3/30, 5/00*

U.S. Cl. 33—503 **12 Claims**



1. Measuring apparatus, comprising

a probe-supporting assembly,

a probe assembly mounted on said probe-supporting assembly, said probe assembly including a workpiece-contacting member which is movable to positions where the workpiece-contacting member contacts a workpiece,

said probe-supporting assembly including guide means for guiding the probe assembly for movement along a set of coordinate axes,

position-sensing means for providing values which indicate positions of the workpiece-contacting member when it contacts a workpiece,

means for bathing the probe-supporting assembly in a liquid heat transfer medium, and

means for controlling the temperature of the liquid heat transfer medium to maintain it at a constant temperature to prevent thermal expansion and contraction of said probe-supporting assembly,

a housing which encloses the probe-supporting assembly to deter loss of liquid heat transfer medium and to shield the probe-supporting assembly from ambient air currents,

said housing having a wall with an opening through which the probe assembly extends, said wall including deformable components which enable the opening and the probe assembly to move parallel to said wall.

5,179,787

DRAPERY INSTALLATION TOOL

Clarence Ostrowski, 1482 Chy Y, Hatley, Wis. 54440

Filed Jun. 5, 1991, Ser. No. 710,327

Int. Cl.[5] G01B *5/14;* **B25H** *7/00*

U.S. Cl. 33—613 **9 Claims**

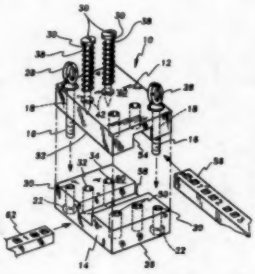
1. A drapery installation tool comprising:

a clamping block;

means to identify, in coordinate fashion, the location of a bracket for a supporting rod relative to a ceiling and a window casing carried by said clamping block; and

means to provide starter holes for bracket screws;

said means to provide starter holes comprising at least two spring biased pin means guided by at least two bores in said clamping block, each spring biased pin means having a flange thereon formed from a lock washer and guided by a counterbore in said clamping block, said spring biased



pin means when struck by a hammer means forming said starter holes;

said at least two spring biased pin means being used as a center punch means, and further including at least one drill guide means formed by a bore through said clamping block for guiding a drill to form said starter holes at the location identified by said spring biased pin means.

5,179,788

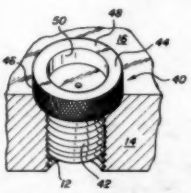
LOCATING PLUG FOR THE CENTERLINES OF HOLES

Albert A. Jadach, 1820 Vinton, Royal Oak, Mich. 48067

Filed May 11, 1992, Ser. No. 881,197

Int. Cl.[5] G01D *21/00*

U.S. Cl. 33—644 **6 Claims**



1. A fixture for use in locating the centerline of a cylindrical hole formed in a workpiece through use of a programmable coordinate measurement machine, said fixture comprising:

a cylindrical section having an outer diameter approximating the inner diameter of the hole, adapted to be inserted into said hole;

a head section of greater dimension than the cylindrical section joined to the cylindrical section in a substantially transverse, planar shoulder adapted to abut the workpiece surface surrounding the hole when the cylindrical section is inserted within the hole; and

a cylindrical counterbore formed in the surface of the plug head section opposite to the shoulder section, the cylindrical counterbore being formed concentrically with the centerline of the cylindrical section, whereby the probe of a programmable coordinate measurement machine may be moved into the counterbore and brought into contact with three spaced points on the interior diameter of the counterbore with three programmed motions so that the coordinate measurement machine can calculate the centerline of the counterbore and accordingly, the centerline of the cylindrical hole.

5,179,789

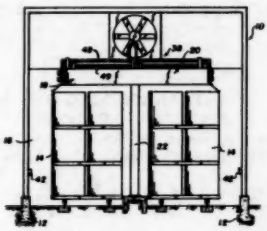
KILN WITH AUTOMATIC CONTROL OF HEAT DISTRIBUTION

Brian T. Stroud, Richmond; Grant D. Maxwell, Coquitlam, and Ronald E. Rohachuk, Richmond, all of Canada, assignors to The COE Manufacturing Company (Canada), Inc., Vancouver, Canada

Continuation of Ser. No. 560,951, Aug. 1, 1990, abandoned. This application Dec. 30, 1991, Ser. No. 815,836

Int. Cl.[5] F26B *21/00*

U.S. Cl. 34—54 **9 Claims**



1. In a drying kiln having a drying chamber, means for heating air, a ducting system in the drying chamber for distributing heated air, means for circulating heated air through the ducting system, and venting means in the ducting system to release heated air to the drying chamber, the improvement comprising said ducting system extending substantially the length of said drying chamber and said venting means comprising a plurality of apertures formed along the length of said ducting system to define a plurality of drying zones within said drying chamber, heated air flow control means for controlling the flow of heated air to said apertures, and temperature sensing means in said drying chamber in communication with said heated air flow control means for automatic control thereof to deliver heated air to each drying chamber zone as required to achieve any desired temperature distribution throughout the drying chamber.

5,179,790

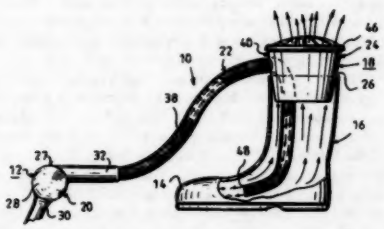
HOT AIR BOOT DRYER

Steven L. Poulos, 55 Champlain St., Port Jefferson Station, N.Y. 11776

Filed Nov. 18, 1991, Ser. No. 793,623

Int. Cl.[5] F26B *25/00*

U.S. Cl. 34—104 **10 Claims**



1. A hot air boot dryer which comprises:

means for applying hot air within the interior and towards a toe area of a boot to remove moisture therefrom; and

means for exhausting the hot air and moisture out of the boot, so that the interior of the boot can become dry;

said hot air applying means including a blower for producing the hot air, and an elongated conduit for carrying the hot air within the interior and towards the toe area of the boot;

said hot air and moisture exhausting means including an exhaust fan insertable into an open top of the boot, so as to blow the hot air and moisture out of the boot;

said hot air blower of said hot air applying means is an electric hair dryer comprising: a motor and heating coil housing, a handle extending from one side of said motor and heating coil housing, a barrel extending from another side of said motor and heating coil housing, an electric cord connected to a motor and heating coil within said motor and heating coil housing and extending outwardly from the bottom of said handle, and a plug on the distal end of said electric cord to connect to a power source;

said elongated conduit is a flexible pipe extending from an end of said barrel of said electric hair dryer and through said exhaust fan.

5,179,791

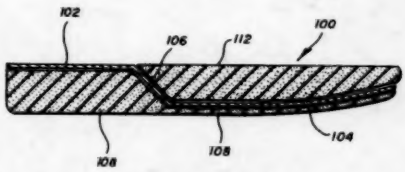
TORSIONAL SPRING INSOLE AND METHOD

Cheng K. Lain, 2092 Fourteenth Ave., San Francisco, Calif. 94116

Filed Aug. 19, 1991, Ser. No. 747,269

Int. Cl.[5] A43B *13/28, 13/38, 13/41, 21/30*

U.S. Cl. 36—27 **19 Claims**



1. A torsional spring insole for use in footwear comprising, in combination:

elevated means for supporting the heel of a foot;

means in communication with said elevated heel supporting means for providing a torsional spring capability to an insole; and

energy storing step-down means for connecting said elevated heel supporting means to said torsional spring means for flexing said torsional spring means in response to a pressure imbalance applied to said elevated heel supporting means, said torsional spring means subsequently reflexing to position said elevated heel supporting means to counteract said pressure imbalance.

5,179,792

SHOE SOLE WITH RANDOMLY VARYING SUPPORT PATTERN

Charles R. Brantingham, 1541 Los Padres Rd., Nipomo, Calif. 93444

Filed Apr. 5, 1991, Ser. No. 682,092

Int. Cl.[5] A43B *13/20*

U.S. Cl. 36—29 **10 Claims**

4. A sole for providing support to a foot within a shoe, comprising:

a plurality of inflatable cells disposed within such sole

wherein the angular orientation of a foot supported by such sole in relation to a supporting surface under said sole is a function of the pattern defined by combinations of inflate and deflated cells at any time; and

means for sequentially inflating and deflating each of said cells in a sequence which defines said pattern as the sole is alternatively weighted and unweighted by said foot.

5,179,793

FLOATING DREDGER

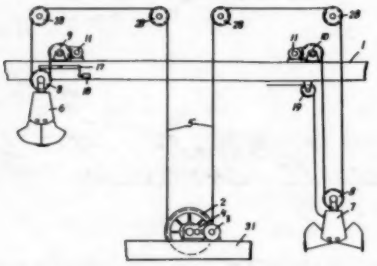
Wolfgang Rohr, Zeppelinstrasse 16, 6720 Speyer, Fed. Rep. of Germany

Filed Oct. 15, 1990, Ser. No. 596,967

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1989, 3937317

Int. Cl.[5] E02F *3/47*

U.S. Cl. 37—71 **4 Claims**



1. Floating dredger with one floating body (31), on which a framework (1) is arranged, said framework being provided with a hoisting unit which propels, between upper and lower limit positions, two countercurrently driven clam-shell grippers (6,7) each having their own opening and closing mechanism, said floating dredger hoisting unit having at least one driving pulley (2), a hoisting rope (5) is placed over said at least one driving pulley (2), rope pulleys (8) for each of the grippers, and the hoisting rope ends are each fastened to a compensating winch (9,10), which provides for rope compensation for varying dredging depths between said upper and lower positions.

5,179,794

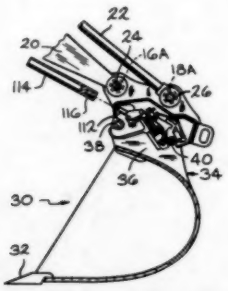
SEMI-AUTOMATIC COUPLING APPARATUS

Jon C. Ballinger, 412 Scarlet Oak Dr., Findley, Ohio 45840

Filed Dec. 26, 1991, Ser. No. 813,446

Int. Cl.[5] E02F *3/28, 3/96*

U.S. Cl. 37—117.5 **20 Claims**



9. A coupling apparatus comprising, in combination,

first throat means for engaging a first crossbar,

second throat means for engaging a second crossbar parallel to and spaced from said first crossbar,

wedge means disposed for linear translation between a first position in which said second crossbar may be translated into and out of said second throat means and a second position in which said second crossbar is retained in said second throat means, said wedge means including a surface for engaging said second crossbar and seating said second crossbar in said second throat when said wedge means is in said second position,

means for translating said wedge means toward said first position, and

compression spring means for biasing said wedge means toward said second position.

5,179,795

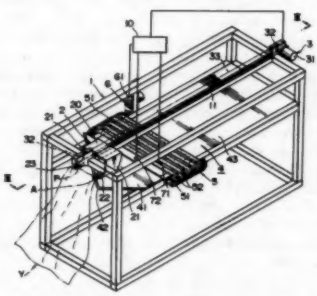
DEVICE FOR STRAIGHTENING ONE EDGE OF RECTANGULAR SHEET

Yoshizo Nakamura, Takamatsu; Kenzo Oyabu, Marugame, and Nakanori Tomozawa, Takamatsu, all of Japan, assignors to Tokai Co., Ltd., Japan

Filed Oct. 24, 1991, Ser. No. 781,838

Int. Cl.[5] D06F *67/04;* B65H *9/12*

U.S. Cl. 38—143 **4 Claims**



1. A device for straightening an edge (DA) of a rectangular flexible sheet having four vertexes (A through D) and four edges (AB, BC, CD and DA), comprising:

a frame;

a plate secured to said frame and extending longitudinally from a front end to a rear end thereof, said plate having a first location adjacent to said front end and a second location adjacent to said rear end, said first and second locations being longitudinally spaced apart from each other with a distance greater than a length of any of the edges of the flexible sheet, said front end being tapered and forming a tapered tip end;

movable means supported on said frame and movable above said plate along the longitudinal direction of said plate;

a pair of laterally spaced apart, first and second holders for holding predetermined portions of the flexible sheet, each of said first and second holders being secured to said movable means for movement therewith, wherein, upon movement of said movable means, said first and second holders move along predetermined, spaced apart, first and second paths, respectively, said tapered tip end of said plate being located between said first and second paths;

displacing means for moving said movable means;

conveyor means having a conveying surface laterally extending between one end and the other end of said plate such that said first path is located between said one end and said other end and said second path is located spaced from said first path and between said one end and said other end, said conveying surface being disposed above said plate and movable in the lateral direction of said plate;

drive means for moving said conveyor means;

detector means for detecting whether or not said edge (DA) of said flexible sheet on said conveyor means is present on said first path; and

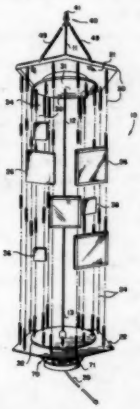
control means coupled to said detector means and said drive means for controlling said drive means such that said conveying surface moves in a direction from said first path to said second path when said detector means detects the presence of the edge (DA) of the flexible sheet on said first path and in a direction from said second path to said first path when said detector means does not detect the presence of the edge (DA) of the flexible sheet on said first path, whereby one vertex (A) of the four vertexes (A through D) of the flexible sheet held by said first holder and an intermediate portion (P) of an adjacent vertex (B) held by said second holder, are moved on said plate from said first location to said second location upon an actuation of said displacing means with the edge (DA) of the flexible sheet being laterally displaced by said conveyor means and straightened parallel to said first path.

5,179,796

COUNTER-REVOLVING DISPLAY CAROUSEL

Robert J. Gephart, Jr., 232 Culvert St., Jersey Shore, Pa. 17740

Filed Apr. 11, 1991, Ser. No. 683,921
Int. Cl.[5] G09F *11/02*
U.S. Cl. 40—473 **19 Claims**



1. A display device comprising:

a first display assembly including a first top plate, a first bottom plate and means connecting said first top and first bottom plates,

a second display assembly including a second top plate, a second bottom plate and means connecting said second top plate and said second bottom plate, said second display device located between said first top and bottom plates of said first display assembly,

a suspension device including means rotatably suspending at least one of said display assemblies,

drive means to rotate said first bottom plate in one direction and to rotate said second bottom plate in a direction opposite to said one direction, and

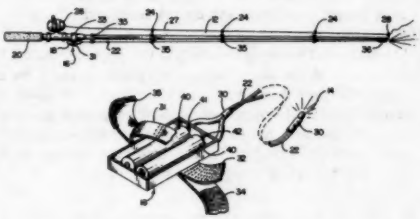
means preventing rotation of said drive means.

5,179,797

NIGHT FISHING LIGHT

John J. Edwards, P.O. Box 434, Sylvan Beach, N.Y. 13157, and Billy J. Lohr, R.D. 1 Box 183, Higginsville Rd., Durhamville, N.Y. 13054

Filed Nov. 26, 1991. Ser. No. 797,997
Int. Cl.[5] A01K *75/02*
U.S. Cl. 43—17.5 **7 Claims**



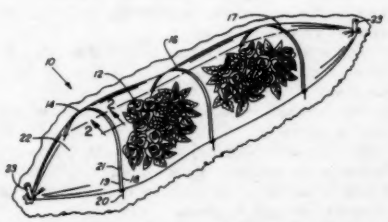
1. A night fishing tip light arrangement for a fishing rod of the type having a handle at a proximal end, a tip top eyelet at a distal end and a plurality of line guides disposed along the rod to carry fishing line along one side of the rod and having a reel mounted on said proximal end, said tip light arrangement comprising a battery holder having an open side through which one or more battery cells can be installed and a back opposite said open side, a first pair of straps which are affixed onto said battery holder back and which mate together over said open side to retain said one or more cells in said holder and a second pair of straps affixed onto said back and which mate together over said rod handle to removably mount the battery holder onto said handle; a pair of wire conductors affixed at one end onto electrical terminals or leads on said battery holder, and extending distally to said rod tip top eyelet; an LED having a pair of terminals affixed to the respective wire conductors at their distal ends; and cable tie means attaching said LED to said rod tip top eyelet and attaching said wire conductors to said rod, each cable tie means being positioned at a respective one of said line guides so that the wire conductors and said LED are disposed on an opposite side of said rod away from said one side.

5,179,798

PORTABLE GREENHOUSE

Henry Sonagere, 5040 SE. Burningtree Cir., Stuart, Fla. 34977

Filed Dec. 11, 1990, Ser. No. 625,748
Int. Cl.[5] A01G *13/04*
U.S. Cl. 47—29 **4 Claims**



1. A method of protecting plants comprising the steps of:

(1) providing a first rod having a first length, providing a second rod having a length shorter than said first rod and two end portions extending at right angles to said shorter length, securing the ends of said second rod to said first rod whereby end portions of said first rod extend beyond the right angle portions to form spikes and said first and second rods extend in spaced parallel relationship, said

space being such that when said rods are bent into an arch like shape sufficient space remains between said rods to loosely receive a sheet of plastic in slidable or freely movable relationship relative to said first and second rods;

(2) identifying an area to be protected;

(3) shaping the supports to conform to plants to be protected in the area;

(4) placing a plurality of supports in the ground with the spikes being inserted into the ground;

(5) providing a plastic sheet of sufficient size to cover said area having axial ends and lateral ends; and

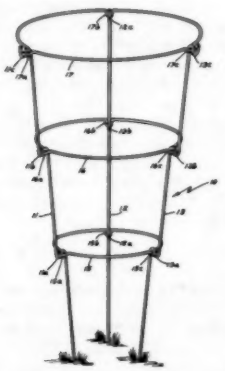
(6) securing peg members at each axial end of the plurality of supports, and securing the sheet to the pegs to close off the axial ends of the sheet and protect plants covered by the sheet, the sheet remaining freely movable relative to first and second rods such that it may be pulled upwardly between the first and second rod to provide access to the area to be protected, the sheet remaining secured by the peg member when it is pulled upwardly.

5,179,799

DEMOUNTABLE TOMATO PLANT SUPPORT

Jerome Hillestad, 26350 Fallbrook Ave., Wyoming, Minn. 55092

Filed Apr. 16, 1992, Ser. No. 868,956
Int. Cl.[5] A01G *17/06*
U.S. Cl. 47—45 **4 Claims**



1. A tomato plant support structure, comprising

a plurality of elongated rod members the full height of the support structure,

double open ended loops formed in said rod members forming seats spaced therealong,

a plurality of ring members,

said ring members respectively being of successively increased diameter,

spaced open ended loops projecting outwardly respectively formed in the periphery of each of said ring members,

said loops on said ring members being equal in number to the number of said rod members,

said rod members being positioned to being upright in spaced relation forming an enclosure, and having their respective loops at successive elevations,

said ring members being respectively disposed between said upright rod members at each elevation of said loops of said rod members, whereby

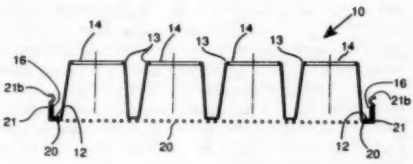
the respective loops of said ring members and said rod members interengage in a releasable locked engagement.

5,179,800

SELF-WATERING AIR-PRODUCING PLANT TRAY SYSTEM

Barney K. Huang, 3332 Manor Ridge Dr., Raleigh, N.C. 27603

Filed Jun. 14, 1991, Ser. No. 715,608
Int. Cl.[5] A01G *9/02*
U.S. Cl. 47—73 **13 Claims**



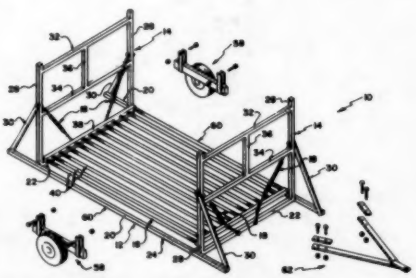
1. An air pruning plant tray with a readily detachable frictionally fitted bottom screen comprising: a plant tray having a top, bottom, surrounding side structure, and means incorporated within the plant tray for containing a plant growing medium such as soil, peat cake or peat mix; a screen detachably secured to the bottom of the plant tray for retaining the plant growing medium within the plant tray and for giving rise to air pruning, and the detachable screen including a turned up side that extends around the parameter of the screen and wherein the turned up side in an attached mode frictionally engages and couples with the surrounding side structure of the plant tray and effectively couples the screen to the bottom of the plant tray so as to form a unitary plant tray and screen structure, and wherein the screen can be readily removed from the surrounding side structure of the plant tray by pulling the screen away from the plant tray and overcoming the friction existing between the turned up side of the screen and the surrounding side structure of the plant tray.

5,179,801

PORTABLE CATTLE GATE

Victor E. Babchuk, Box 53, Senlac, Saskatchewan, Canada S0L 2Y0 , and Gordon R. Brown, Box 1, Senlac, Saskatchewan, Canada S0L 2Y0

Filed Jul. 5, 1991, Ser. No. 725,328
Int. Cl.[5] E06B *9/52*
U.S. Cl. 49—58 **5 Claims**



1. A cattle gate comprising,

a rectangular grating formed by a plurality of elongate parallel rigid grating bars and two transverse end beams each rigidly connected to the bars at right angles thereto to a respective end of each of the bars;

a rectangular base frame adapted to rest upon a ground surface and comprising a first rigid transverse beam member at a first end of the base frame, a second rigid transverse beam member at a second end of the base frame, a first rigid frame element rigidly connected to said rigid

transverse beam members, a second rigidly frame element parallel to the first frame element and rigidly connected to said rigid transverse beam members, the first and second frame elements lying parallel to the grating bars and being separate therefrom to allow vertical movement of the grating relative to the frame element, the base frame surrounding the grating such that the grating can lie on the ground surface wholly within the base frame;

a first and a second upright member each connected to a respective one of the rigid transverse beam members, reinforcing means connecting said upright members and said frame for providing reinforcement to maintain the upright member in upright orientation such that the upright member is wholly supported by the frame and;

first and second resilient suspension means each connected between a respective one of the upright members and the grating and arranged to support at least a part of the grating spaced from the ground, the suspension means being resiliently deformable to allow the grating to be pushed to the ground within said base frame under weight from a vehicle.

5,179,802

LOUVRE STRUCTURES

Peter A. Higton, Forest Row, United Kingdom, assignor to Hightons Arganisation Limited, West Sussex, United Kingdom

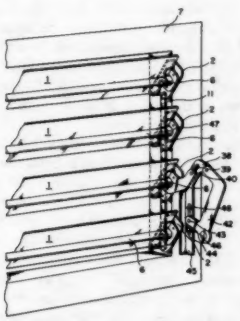
PCT No. PCT/GB89/01028, § 371 Date May 1, 1991, § 102(e) Date May 1, 1991, PCT Pub. No. WO90/02862, PCT Pub. Date Mar. 22, 1990

PCT Filed Sep. 4, 1989, Ser. No. 659,373

Claims priority, application United Kingdom, Sep. 2, 1988, 8820793

Int. Cl.[5] E05F *17/00*

U.S. Cl. 49—74 **5 Claims**



1. A louvre window structure comprising a generally rectangular frame and a plurality of rectangular louvre boards mounted relative to the frame to be pivotable between a closed position in which the longitudinal edges of the louvre boards overlap and are in close contact and an open position in which the louvre boards are separated, wherein each louvre board is mounted with its opposed shorter edges received in channel shaped holding members, said holding members for each louvre board are carried on a bar which extends across the frame and the ends of which are received in recesses in opposed frames members such that each bar is axially rotatable relative to the frame but is prevented from substantial linear movement so that the bars cannot be removed from the frame after the frame and bars structure has been assembled, and wherein the holding members on at least one side of the structure are connected together by a coupling member which is not connected to the frame and a louvre board actuating means is affixed to one only of the holding members whereby said louvre board associated with said holding member can be caused to pivot relative to the frame with the coupling means ensuring simultaneous movement of the remaining louvre boards between a closed and an open position is effected.

5,179,803

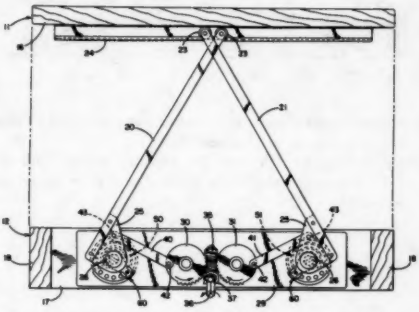
OPERATING MECHANISM FOR A ROOF WINDOW

Robert F. Lense, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Nov. 18, 1991, Ser. No. 793,469

Int. Cl.[5] E05F *1/10, 11/00*

U.S. Cl. 49—386 **9 Claims**



1. A window having a frame, a sash having first and second opposite end portions, means pivotally connecting said first end portion of said sash to said frame and supporting said sash to swing between open and closed positions about a laterally extending axis, and mechanism on said frame adjacent the second end portion of said sash for moving said sash between said positions, said mechanism comprising first and second arms each having one end portion connected to the second end portion of the sash to swing with and to move laterally along the sash, said first and second arms having opposite end portions supported on said frame to turn about first and second laterally spaced axes, respectively, selectively operable means located between said first and second axes for swinging said first and second arms simultaneously but oppositely about said first and second axes, respectively, in either an opening direction or a closing direction, said arms extending and pushing said sash to said open position when said arms are swung in said opening direction, said arms retracting and pulling said sash to said closed position when said arms are swung in said closing direction, and first and second torsion springs coaxial with said first and second axes and connected between said frame and said first and second arms, respectively, said springs being wound as said arms are swung in said closing direction and then unwinding as said arms are swung in said opening direction thereby to assist in moving said sash to said open position.

5,179,804

SELF DRAINING DOOR SILL ASSEMBLY

Robert H. Young, Rt. 3 Box 177, Beaver Dam, Ky. 42320

Filed Oct. 31, 1991, Ser. No. 785,983

Int. Cl.[5] E06B *1/70*

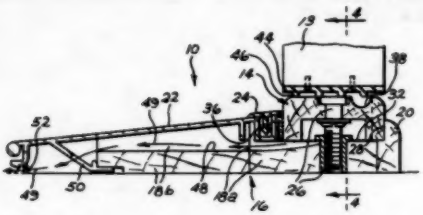
U.S. Cl. 49—471 **19 Claims**

1. A self draining, adjustable door sill assembly comprising:

an elongate base adapted for disposition along a lower side of an exterior door frame between a pair of door jambs;

an elongate threshold member disposed over and adjustably connected to said base for cooperating, in a close fitting relationship, with a lower edge of a door when said door is in a closed position in said frame, said member and base defining an elongate water chamber therebetween, said member also defining an upwardly opening storm drain channel in an upper, interior facing side surface portion

thereof, opposite ends of said drain channel terminating in and communicating with a pair of slots located on opposite ends of said member, said slots also communicating with opposite ends of said water chamber;



a weather cover panel connected to and overlying an exterior side portion of said base; and

means defined by said base for draining water from said water chamber exteriorally beyond said door frame and assembly.

5,179,805

SANDING METHOD AND APPARATUS

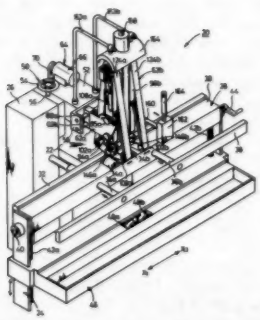
Suteyoshi Numao, Kanuma, and Makoto Miyajima, Hino, both of Japan, assignors to Murunaka & Co., Ltd.; Marunaka Kakoki Co., Ltd. and Marunaka Tsusho Co., Ltd., all of Shizuoka, Japan

Filed Dec. 30, 1988, Ser. No. 292,392

Claims priority, application Japan, Sep. 19, 1988, 63-234242; Sep. 19, 1988, 63-234243; Nov. 14, 1988, 63-148673[U]; Nov. 14, 1988, 63-148674[U]

Int. Cl.[5] B24B *21/00*

U.S. Cl. 51—149 **35 Claims**



1. A method of sanding a surface of a workpiece, comprising the steps of:

feeding said workpiece in a feeding direction;

providing a plurality of endless belt sanding members in juxtaposed relation substantially along said feeding direction such that said endless belt sanding members are oriented in a direction transverse to said feeding direction;

pressing said endless belt sanding members against the surface of the workpiece; and

reciprocally moving said endless belt sanding members simultaneously in mutually different directions along said feeding direction.

5,179,806

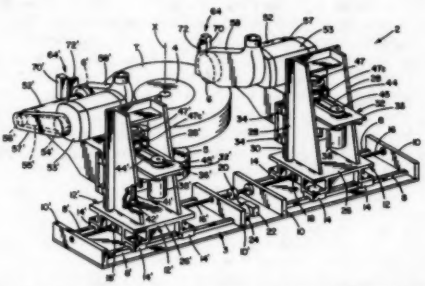
METHOD AND APPARATUS FOR BUFFING A TIRE SIDEWALL

Robert L. Brown, Hartville; Thomas E. Codispoti, Akron, and Kenneth W. Dunaway, Massillon, all of Ohio, assignors to General Tire, Inc., Akron, Ohio

Filed Jan. 29, 1991, Ser. No. 647,081

Int. Cl.[5] B24B *49/00*

U.S. Cl. 51—165.71 **10 Claims**



1. An apparatus for removing material from a first portion of a sidewall surface of a tire, including a base for supporting the tire for rotation about an axis, drive means mounted on said base for rotating the tire about said axis, a carriage mounted on said base adjacent said sidewall surface and moveable toward and away from said sidewall surface in an axial direction, namely a direction substantially parallel to the axis of rotation of the tire, and a cutting device mounted on said carriage for removing material from the said first portion of the sidewall surface, wherein the improvement comprises:

(a) a sensor device mounted on said carriage and spaced radially from said cutting device in relation to the axis of rotation of the tire and positioned to contact a second portion of the sidewall surface that is spaced radially from said first portion relative to the axis of rotation of the tire and to measure the axial distance between said second portion and said cutting device;

(b) a computer control device connected to said sensor device for detecting a difference between the axial distance measured by said sensor device and a desired axial distance, said computer control generating a command when said difference is detected,

(c) a drive device connected to said carriage for moving said carriage and the cutting device mounted on said carriage toward or away from said first portion of the sidewall surface, said drive device also being connected to said computer control device to receive commands from the computer control device and to move said carriage in response to said commands to maintain the axial distance between the cutting device and the second portion of the sidewall surface substantially equal to the desired axial distance, so that the cutting device cuts the first portion of the sidewall surface at a level that is spaced at said desired axial distance from the second portion of the sidewall surface.

5,179,807

FLOOR SANDING DEVICE

Donald W. Gupton, 5884 Pontius Ct., San Jose, Calif. 95123

Filed Nov. 18, 1991, Ser. No. 793,173

Int. Cl.[5] B24D *15/00*

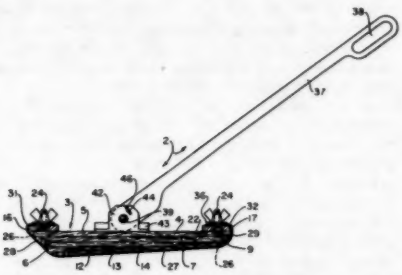
U.S. Cl. 51—174 **5 Claims**

1. A floor sanding device for actuation by a workman from an erect attitude and adapted to receive and support an abrading medium, comprising:

a) a shoe plate having top and bottom surfaces intercepted

by front and rear end edges, said shoe plate diminishing in thickness from said front end edge to said rear end edge and said bottom surface being shorter than said top surface;

a) an elongated handle pivotally mounted on the top surface of said shoe plate intermediate the front and rear end



edges thereof whereby the sanding device may be reciprocated on a floor by a workman standing in an erect attitude; and

a) clamp means mounted on the top surface of said shoe plate adjacent the front and rear end edges thereof and selectively manipulable to retain an abrading medium mounted on the bottom surface of said shoe plate.

5,179,808

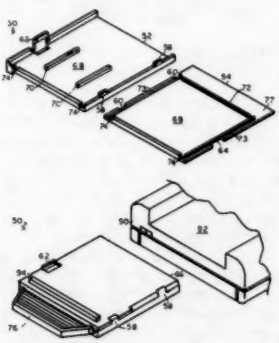
VIDEO GAME OR COMPUTER CLEANING CARTRIDGE

Louis J. Bakanowsky, III, Fitchburg, Mass., assignor to Curtis Manufacturing Company, Inc., Jaffrey, N.H.

Continuation-in-part of Ser. No. 743,598, Aug. 12, 1991, and a continuation-in-part of Ser. No. 721,163, Jun. 26, 1991, Pat. No. 5,144,775. This application Jun. 18, 1992, Ser. No. 900,416

Int. Cl.[5] B08B *1/00*; B24B *27/033*

U.S. Cl. 51—205 WG **12 Claims**



1. A cleaning cartridge device for cleaning electrical contacts within a computer video game receptacle, which device comprises:

a) a cartridge composed of one or more sections, said cartridge having an elongated opening on a first side to be mounted within the computer video game receptacle adjacent to the electrical contacts therein;

b) a planar board means, a portion of which is positioned within the cartridge, said planar board means capable of being moved therein between a cleaning and non-cleaning position;

c) the planar board means having a cleaning surface at the one end and a handle means at the other, said handle means projecting rearward of said cartridge through an elongated slot on a second side of said cartridge opposite said first side; and;

d) stop means in the cleaning cartridge device to prevent the movement of the planar board means past the cleaning and non-cleaning positions, said stop means including one or more apertures in the planar board means and one or more corresponding parallel spaced guide rails on the cartridge, said apertures receive said guide rails for guiding the board means during movement between the cleaning and non-cleaning positions, whereby the electrical contacts are cleaned by the movement of the cleaning surface when the planar board means is moved between the cleaning and non-cleaning positions.

5,179,809

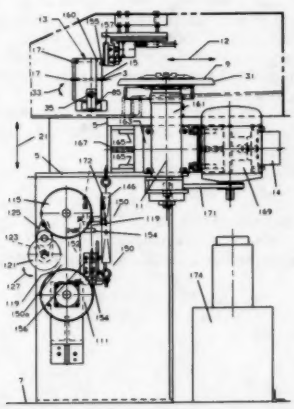
DRILL GRINDING MACHINE

Richard L. Schroeder, North Fond du Lac, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.

Division of Ser. No. 513,080, Apr. 23, 1990, Pat. No. 5,125,186. This application Apr. 8, 1992, Ser. No. 865,555

Int. Cl.[5] B24B *3/00*

U.S. Cl. 51—288 **5 Claims**



1. A method of sharpening a selected point on a twist drill comprising the steps of:

a. providing a housing with a grinding wheel having an axis of rotation;

b. providing a spindle having an axis perpendicular to the grinding wheel axis;

c. providing drill, lift, and feed motors;

d. clamping the drill inside the spindle with the drill and spindle axes being coincident and the drill point being proximate the grinding wheel;

e. actuating the drill motor to rotate the spindle and the drill about the drill axis;

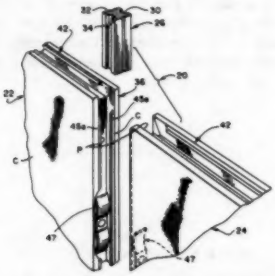
f. simultaneously actuating the lift motor to reciprocate the spindle and the drill in directions perpendicular to the drill axis; and

g. actuating the feed motor to oscillate the spindle and the drill about an axis parallel to the grinding wheel axis in timed relation with the lift and drill motors to move the drill point along a predetermined cyclical path of contact with the grinding wheel to grind the selected point.

5,179,810
PANEL SYSTEM

John L. Gename, Naperville, and David P. Evensen, Wheeling, both of Ill., assignors to Nimlok Company, Niles, Ill.

Filed Nov. 14, 1991, Ser. No. 791,366
Int. Cl.[5] E04B *2/00*
U.S. Cl. 52—240 **6 Claims**

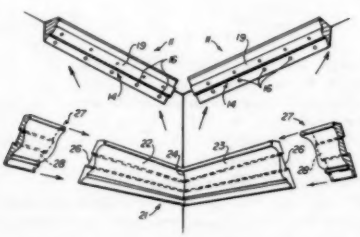


1. A prefabricated panel system comprising a pair of panels arranged in adjacent relation with corresponding peripheral portions thereof disposed in close proximity to one another, each peripheral portion including a complemental first lock component; a complemental second lock component disposed intermediate said panel peripheral portions and in sliding interlocking relation with each of said complemental first lock components; and tensioning means mounted on one of the complemental lock components and, when said second lock component slidably interlocks with said first lock components, said tensioning means resiliently engages said first and second lock components and retains same in a snug interlocking relation, said tensioning means further permitting sliding disengagement between said first and second lock components such that said panels may be readily engaged and disengaged by manual adjustment.

5,179,811
DECORATIVE TRIMMING SYSTEM

William H. Walker, 2825 Cottonwood Dr., Marietta, Ga. 30066, and Kenneth Braswell, 3315 Holliglen Dr., Marietta, Ga. 30062

Filed Dec. 3, 1990, Ser. No. 620,769
Int. Cl.[5] E04F *19/04*
U.S. Cl. 52—287 **14 Claims**



1. An improved decorative trimming system for applying molded trim about the periphery of a room with said decorative trimming system comprising:

bracket means adapted to be secured to the walls of the room extending about a periphery thereof, said bracket means having first and second wall contacting surfaces oriented at an angle to each other, each of said wall contacting surfaces having a front edge, said bracket means further including a surface member extending between the front edges of said wall contacting surfaces at an angle thereto, said surface member having trim mounting means thereon intermediate said front edges of said wall contacting surfaces;

at least one prefabricated corner piece of decorative trim having a first leg and a second leg with said corner piece being adapted to extend around a corner of the room, each of said first and second legs of said corner piece having first and second wall engaging surfaces and a rear face extending between said wall engaging surfaces at an angle thereto corresponding to the angle of said surface member of said bracket means, said rear face having mounting means thereon intermediate said engaging surfaces adapted to engage said trim mounting means;

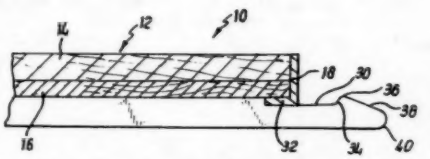
at least one substantially straight length of decorative trim having first and second wall engaging surfaces and a rear face extending between said engaging surfaces at an angle thereto corresponding to the angle of said surface member, said rear face having mounting means thereon intermediate said engaging surfaces adapted to engage said trim mounting means for mounting and securing said straight length of decorative trim abutting and extending from an end of said first leg of said corner piece;

whereby the bracket means can be secured to the walls of the room extending around a periphery thereof whereupon the corner piece can be mounted to the bracket means in a corner of the room and the straight length can be mounted to the bracket means extending from the corner piece to trim the room.

5,179,812
FLOORING PRODUCT

Guy C. Hill, Knutsford, United Kingdom, assignor to Flourlock (UK) Limited, United Kingdom

Filed May 13, 1991, Ser. No. 699,155
Int. Cl.[5] E04D *5/82*
U.S. Cl. 52—589 **9 Claims**



1. A flooring product, comprising a panel with a base, a surround peripherally surrounding and secured to said base, a set of battens secured to said base and extending outwardly of said surround, struts extending from one of said battens and extending outwardly of said surround, said battens having end portions defining grooves for securely receiving said surround and an adjacent surround of another substantially similar flooring product, and said battens, struts, and grooves cooperating with each other to matingly engage and interlockingly connect substantially similar flooring products for securely assembling a portable floor in the absence of screws and nails, said flooring products being disengageable from said floor when said flooring products are inclined relative to the other.

5,179,813
REPAIRING SQUEAKING FLOORS

Lyle J. Martinsen, 315 E. 6310 S.; Stewart L. Martinsen, 631 Mount Vernon Cir., both of Murray, Utah 84107, and Lane G. Martinsen, 7443 S. Rich Way, Salt Lake City, Utah 84121

Filed Apr. 25, 1991, Ser. No. 691,190
Int. Cl.[5] E04B *1/00*
U.S. Cl. 52—743 **18 Claims**

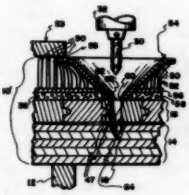
1. A method of de-squeaking a floor comprising the steps of:

drilling a small access opening from a position below the floor through a surface of the floor to a location adjacent to an interface above a subfloor segment of the floor;

causing a removable male projection to be positioned in the

access opening so as to seal the access opening at a site thereof against flow between the seal site and said surface of the floor;

thereafter injecting a flowable filler substance under pressure from the male projection along the access opening between the seal site and the interface and thence along the interface;



removing the male projection from the access opening; allowing the injected filler substance to cure.

5,179,814

CONTROLLED HEAT SEAL DEVICE FOR FASTENING WRAPPERS OF THERMOPLASTIC MATERIAL, IN PARTICULAR IN MACHINES FOR OVERWRAPPING PACKETS OF CIGARETTES AND THE LIKE

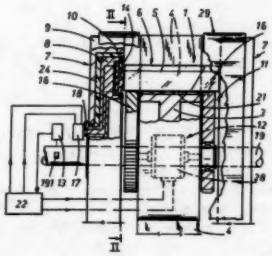
Roberto Osti, Zola Predosa, and Alessandro Minarelli, Bologna, both of Italy, assignors to GD. S.p.A., Bologna, Italy

Filed May 19, 1992, Ser. No. 885,741

Claims priority, application Italy, May 20, 1991, BO91A000165

Int. Cl.[5] B65B *51/16*

U.S. Cl. 53—75 **10 Claims**



1. A controlled heat seal device for fastening wrappers of thermoplastic material, in particular in overwrapping machines comprising a belt conveyor looped around at least one pulley and embodied with a plurality of transverse slats by which single commodities enveloped in respective wrappers, typically packets of cigarettes, are fed positively toward the device, comprising:

two mutually coaxial disks positioned on opposite sides of the conveyor, each consisting in at least one pair of concentric circular rings rotatable as one with the pulley and thermally insulated one from the other, disposed such that one ring of each pair operates in conjunction with the conveyor by taking up the commodities, each enveloped in a respective wrapper, from the surface of the belt;

heat seal means associated with the rings by which the commodities are taken up from the conveyor in such a way as to afford mutually opposed heated surfaces positioned to enter into contact at least with the areas of the wrapper to be fastened when the commodity is taken up between the rings; and

a diverting element located between the disks, adjustable for angular position about a given axis according to the operating speed of the wrapping machine, by which the commodities enveloped in the respective wrappers are directed between the rings not associated with the heat seal means in such a way that the duration of the heat sealing action remains unaltered whatever the operating speed of the machine.

5,179,815

ARTICLE WRAPPING APPARATUS

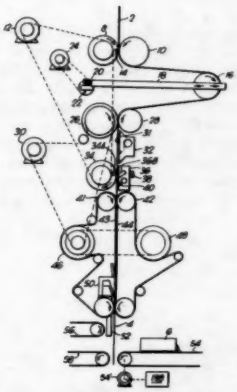
Michael J. Cahill; Jeffrey J. Patchett; David R. Seaward; Graham L. Shirley, and Geoffrey W. Vernon, all of Coventry, England, assignors to Molins PLC

Filed Feb. 19, 1991, Ser. No. 656,677

Claims priority, application United Kingdom, Feb. 17, 1990, 9003675; Nov. 28, 1990, 9025906

Int. Cl.[5] B65B *11/06, 41/02, 61/18*

U.S. Cl. 53—133.3 **24 Claims**



1. Article wrapping apparatus, comprising:

means for feeding a wrapper web along a path;

first severing means at a first position on the path for performing a first severing operation on the web;

second severing means at a second position on the path for performing a second severing operation on the web, said second severing operation facilitating division of the leading end of the web into successive separate wrapper sections;

means for conveying articles in series;

means for conveying said successive wrapper sections to a position at which they are intercepted by successive articles delivered by said article conveying means so as to become at least partially wrapped around the leading portions of said articles; and

control means for adjusting the length of a wrapper section including first means for varying the path length of the web between said first and second positions so as to control the relative positions on the web of said first and second severing operations and second means for adjusting the frequency of said second severing operation on the web so that predetermined lengths of wrapper section are produced.

5,179,816

APPARATUS FOR AUTOMATICALLY FORMING, FILLING, SEALING AND SEPARATING FILM PACKAGING FROM A FILM WEBBING

John Wojnicki, 10 Millstone Dr., Cranbury, N.J. 08512

Filed Nov. 12, 1991, Ser. No. 790,967

Int. Cl.[5] B65B *43/04, 43/30, 61/18*

U.S. Cl. 53—133.4 **20 Claims**

1. An apparatus for automatically forming, filling, sealing and separating film packaging from a film webbing comprising:

a. a housing means including an upstream end thereof for receiving of the film webbing and a downstream end thereof;

b. a film supply means positioned adjacent said upstream end of said housing means for providing a continuous supply of film webbing thereto;

c. a longitudinal support bar mounted with respect to said housing means and adapted to receive film webbing from said film supply means for support thereon in a vertically extending orientation, said longitudinal support bar adapted to abut the film webbing at an intermediate position thereunder and allow portions of the film webbing to extend downwardly on both sides of said longitudinal support bar;

d. a side sealing means adapted to grip the film webbing and form vertically extending side seals therein;

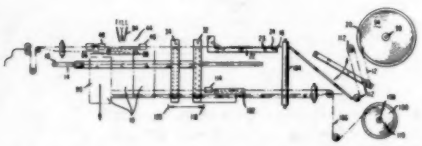
e. a side cutting means for vertically cutting of the film webbing adjacent the side seals formed therein by said side sealing means;

f. a top slitting means adapted to cut an opening in the film webbing adjacent the top edge thereof to form a first top pouch edge and second pouch edge and a top pouch opening therebetween for each individual packaging;

g. a loading station adapted to fill the packaging comprising:

1. an upstream film clamping means adapted to clamp the film webbing prior to filling thereof;

2. a downstream film clamping means located downstream with respect to said upstream film clamping means and adapted to clamp the film webbing prior to filling thereof, said downstream film clamping means being movable longitudinally with respect to the film web-



bing positioned within said loading station between a pre-loading position and a loading position, said loading position being located upstream with respect to said pre-loading position to provide sufficient slack in the film webbing between said downstream film clamping means and said upstream film clamping means to allow the first top pouch edge and the second top pouch edge to separate to open the top pouch opening therebetween and allow loading of the packaging;

3. a first pouch opening means fixedly secured with respect said housing means and oriented at an oblique angle extending laterally outwardly and upstream with respect to the film webbing located within said loading station, said first pouch opening means including a first gripping means adapted to grip the first top pouch edge of the film webbing prior to filling thereof, said first pouch opening means being movable between a first closed position adjacent the film webbing and a first opened position spatially disposed with respect to said film webbing in a lateral and upstream direction, said first pouch opening means being responsive to being in said first closed position for said first gripping means to grip the first top pouch edge of the film webbing with first top pouch edge and the second top pouch edge being adjacent and the top pouch opening therebetween being closed, said first pouch opening means being responsive to movement to said first opened position for said first gripping means to maintain grip of the first top edge of the film webbing and move the first top edge of the film webbing away from the second top edge of the film webbing for opening of the top pouch opening thereof to facilitate loading therethrough;

4. a second pouch opening means fixedly secured with respect said housing means on the opposite side of the film webbing with respect to said first pouch opening means, said second pouch opening means being oriented at an oblique angle extending laterally outwardly and upstream with respect to the film webbing located within said loading station, said second pouch opening means including a second gripping means adapted to grip the second top pouch edge of the film webbing prior to filling thereof, said second pouch opening means being movable between a second closed position adjacent the film webbing and a second opened position spatially disposed with respect to said film webbing in a lateral and upstream direction, said second pouch opening means being responsive to being in said second closed position for said second gripping means to grip the second top pouch edge of the film webbing with first top pouch edge and the second top pouch edge being adjacent and the top pouch opening therebetween being closed, said second pouch opening means being responsive to movement to said second opened position for said second gripping means to maintain grip of the second top edge of the film webbing and move the second top edge of the film webbing away from the first top edge of the film webbing for opening of the top pouch opening thereof to facilitate loading therethrough;

5. a filling means positioned above said first pouch opening means and said second pouch opening means adapted to supply materials to be filled downwardly to pass into the packaging through the top pouch opening thereof;

h. a sealing means adapted to seal the first top pouch edge with respect to the second top pouch edge and seal the top pouch opening after filling thereof;

i. a cutting means adapted to cut the formed package from the film webbing material after sealing of the top pouch opening thereof; and

j. a discharge means adapted to expel the finally formed package from said housing means.

5,179,817

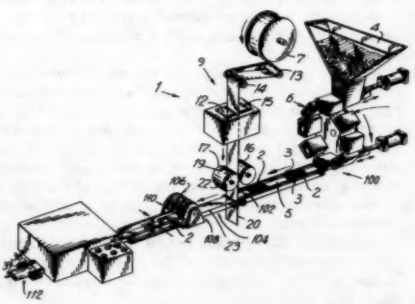
METHOD WHERE EXPOSED FOIL ON TOP OF CIGARETTE BUNDLE IS FLAT WITH NO APPARENT FOLDS

John D. Barnes, Newport News; Howard H. Fishburne, Charlotte; Xuan M. Pham, and Linwood L. Pitt, Jr., both of Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 15, 1990, Ser. No. 567,810

Int. Cl.[5] B65B *11/08, 19/22*

U.S. Cl. 53—148 **11 Claims**



1. An apparatus for folding wrapping material around a bundle of cigarettes where the exposed wrapping material on the top of the bundle is flat with no apparent folds, comprising:

means for bundling a plurality of cigarettes, such that the

bundle comprises two rows of cigarettes with two outboard cigarettes nested between the rows at the ends of the rows and having a leading end and a trailing end;

means for transporting the bundle through the apparatus;

means for supplying a length of wrapping material in which the bundle is wrapped;

a pair of side folders for tucking the wrapping material at the outermost parts of the leading end of the bundle inward;

a first top folder for forming a first top fold against the exterior surface of the trailing end of the bundle such that the first top fold is located at an upstanding end of the bundle when the bundle is placed in a cigarette box;

a second top folder for forming a second top fold against the exterior surface of the trailing end of the bundle such that the second top fold substantially covers the first top fold and is visible when the bundle is placed in a cigarette box in an upstanding position;

a pair of tuckers for pressing the outermost parts of the wrapping material at the trailing end of the bundle after the first top fold and the second top fold have been formed flat against the longitudinal sides of the bundle "hereby the exposed wrapping material on the top of the bundle is flat with no apparent folds; and

a pair of longitudinal side folders for pressing the wrapping material along the axial sides of the bundle, each side folder having the arcuate shape of a cigarette for pressing the wrapping material along the outboard cigarettes, the arcuate shape adapted to receive the bundle.

5,179,818

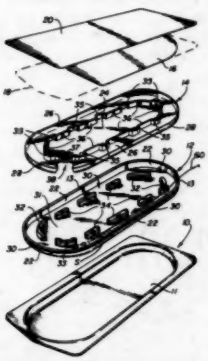
OVAL WRAP SUTURE PACKAGE

Robert J. Kalinski, Milford, N.J.; Robert J. Cerwin, Pipersville, Pa., and Marvin Alpern, Glen Ridge, N.J., assignors to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 541,222, Jun. 20, 1990, Pat. No. 5,099,999, which is a division of Ser. No. 236,057, Aug. 24, 1988, Pat. No. 4,961,498. This application Feb. 7, 1992, Ser. No. 832,278

Int. Cl.[5] B65B *63/04;* A61B *17/06*

U.S. Cl. 53—430 **4 Claims**



1. A method for winding a suture filament in an oval channel of a suture package, said suture filament being attached to a needle at one end and having a second, free end, comprising the steps of winding said filament through said channel ending with its free end and, after the filament is substantially entirely wound in said oval channel, attaching the needle to a needle park location on the package, wherein the step of winding comprises attaching said filament to a stylus at a point in the proximity of its free end, then causing said stylus to travel through said channel to wind said filament through said channel.

5,179,819

METHODS OF PREPARATION OF PACKAGING BAGS FOR BOTTLES, METHODS OF PREPARATION OF PACKAGING BOTTLES AND APPARATUS UTILIZED THEREFOR

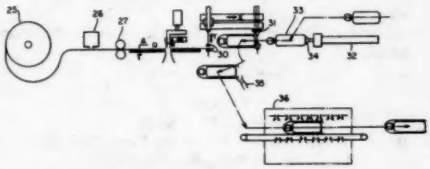
Ryuzo Sukeyasu, Tokyo; Yoshiyuki Kishina, Yamato; Masao Okawa, Niihama; Naoyuki Horigome, Niihama, and Yasuhito Ito, Niihama, all of Japan, assignors to Sumitomo Bakelite Company, Ltd. and Sumitomo Heavy Industries, Ltd., both of Tokyo, Japan

Filed Jul. 15, 1991, Ser. No. 729,936

Claims priority, application Japan, Jul. 20, 1990, 2-192434; Jul. 20, 1990, 2-192435; Aug. 10, 1990, 2-213440

Int. Cl.[5] B65B *9/14, 53/02*

U.S. Cl. 53—442 **30 Claims**



1. A method of continuous preparation of packaging bags for bottles, comprising:

(A) feeding an end part of a long cylindrical film sheet made of heat shrinking film intermittently by the length of a cutting unit along a cutting and heat sealing table and then fixing the end of the long cylindrical film sheet at a definite position on the cutting and heat sealing table;

(B) cutting off a packaging bag and a scrap piece approximately simultaneously from the end of the long cylindrical film sheet by means of:

(i) a heat sealing blade of arch shape which heat seals a closing end of the packaging bag at a position within the length of the cutting unit from the end of the long cylindrical film sheet and which cuts the long cylindrical film sheet at an outer periphery of the heat sealed closing end; and

(ii) a cutting blade of straight shape which is fixed at a position separated from the arch shaped heat sealing blade and which is used for cutting an open end of the packaging bag; and

(c) discharging the scrap piece from the cutting and heat sealing table;

wherein the arch shaped heat sealing blade and the straight shaped cutting blade are fixed to the same sliding block and wherein the arch shaped heat sealing blade and the straight shaped cutting blade have respective tips which are fixed in approximately the same plane so that the two tips contact with the cylindrical film sheet at approximately the same time.

5,179,820

METHOD AND APPARATUS FOR REMOVING CONTENTS FROM AN ENVELOPE

Jeichienus A. van der Werff, Montfoort, Netherlands, assignor to Hadewe B. V., Drachten, Netherlands

Filed May 30, 1991, Ser. No. 707,789

Claims priority, application Netherlands, May 30, 1990, 9001237

Int. Cl.[5] B43M *7/02;* B65B *43/26*

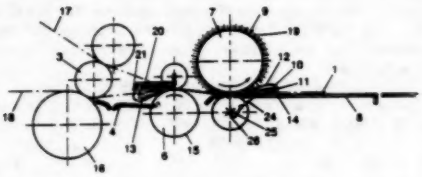
U.S. Cl. 53—492 **27 Claims**

1. A method for removing contents from an envelope having a first and a second panel at least partially severed along three folding edges and interconnected along a fourth folding edge, comprising the steps of:

sliding a portion of the first panel relative to the second panel in a direction of the fourth folding edge in such a manner that a portion of the envelope adjoining a substan-

tially severed folding edge opposite the fourth folding edge curls;

restraining an edge of the second panel opposite the fourth folding edge from following a sliding movement of said



portion of said first panel after a certain degree of curling is reached; and

pivoting said portion of the first panel about the fourth folding edge.

5,179,821

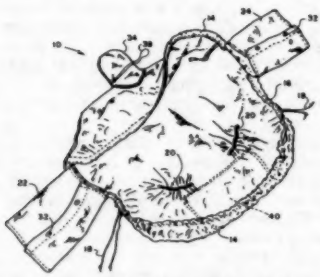
SADDLE SLICKER

Timothy D. Hiser, P.O. Box 314, South Fork, Colo. 81154

Filed Jan. 25, 1991, Ser. No. 645,747

Int. Cl.[5] B68C *1/00*

U.S. Cl. 54—44.1 **3 Claims**



2. A protective cover for a riding saddle of the type having a saddle horn projecting from a front portion of said riding saddle, and stirrups depending from opposite side portions of said riding saddle, said stirrups being attached to said riding saddle by stirrup leathers, said protective cover comprising, in combination:

a flexible central panel;

first and second side panels depending from respective opposite side portions of said flexible central panel, said side panels being adapted to cover said stirrup leathers;

said side panels having mutually coacting snap fasteners, said snap fasteners being adapted to secure said side panels about said stirrup leathers; and,

a saddle horn sleeve, said sleeve being attached to a front portion of said flexible central panel for receiving a saddle horn.

5,179,822

AGRICULTURAL MACHINE WITH A CUTTERBAR DRIVEN BY A PAIR OF GENERALLY VERTICAL DRIVE SHAFTS

Kenneth W. McLean, New Holland, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Filed Sep. 3, 1991, Ser. No. 753,600

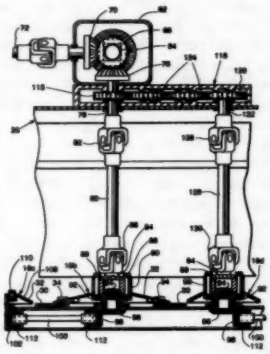
Int. Cl.[5] A01D *34/66*

U.S. Cl. 56—6 **17 Claims**

1. An agricultural machine comprising:

a frame carrying a cutterbar having a plurality of transversely disposed individual rotatable cutting units divided into two laterally opposed groups of cutting units, each said group of cutting units including a laterally outboard end cutting unit located adjacent opposed sides of said frame and an intermediate cutting unit disposed inwardly of said end cutting unit between the opposing said end cutting units;

means for rotatably driving said plurality of cutting units including a pair of generally vertical drive shafts con-



nected respectively to said intermediate cutting units to effect rotation thereof and directly drive said intermediate cutting units; and

power transfer means operably connected to each said vertical drive shaft to transfer rotational power between the operatively connected intermediate cutting unit and the corresponding said end cutting unit for rotatably driving all of said cutting units within the corresponding group of said cutting units.

5,179,823

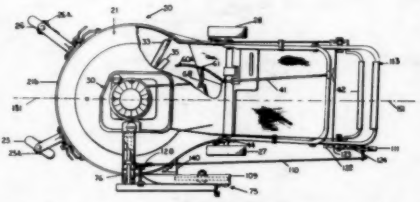
VARIABLE MULCHING MOWER WITH EDGER ATTACHMENT

Sang H. Pace, 3802 Greenshadow, Pasadena, Tex. 77503

Continuation of Ser. No. 734,607, Jul. 23, 1991, abandoned. This application May 11, 1992, Ser. No. 882,756

Int. Cl.[5] A01D *34/73, 34/74, 34/84, 73/18*

U.S. Cl. 56—16.9 **22 Claims**



18. A lawn mowing and trimming apparatus comprising:

a mobile deck member having an upper platform and a pair of front wheels and a pair of rear wheels mounted thereto, said deck member having a deck skirt member extending downwardly from along the periphery of said upper platform to a spaced distance above the plane defined by the lower surfaces of said wheels;

a motor mounted on said deck member, said motor having a motor drive shaft extending downwardly through said upper platform;

an elongate primary rotary cutting blade affixed substantially at its mid-point to said motor drive shaft in a substan-

tially perpendicular radial orientation with respect to the shaft axis;

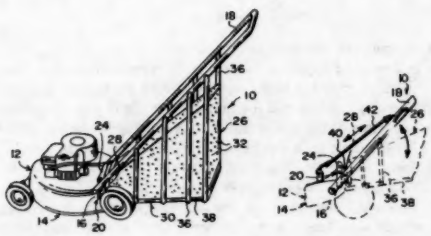
a secondary rotary cutting blade affixed substantially at its mid-point to said motor drive shaft in a substantially perpendicular radial orientation with respect to the shaft axis, said second rotary cutting blade being vertically spaced above said primary blade and being mounted on said motor drive shaft at an acute leading angle with respect to said primary blade in the direction of blade rotation, said primary blade having upturned upwardly facing surfaces at its end portions which induce a vortex-like air stream within said deck member upon rotation of said primary blade whereby said clippings are cut into finer particles by said blades and said finer particles are adapted to be deposited on said lawn, said apparatus being adapted to be moved across a lawn during a mowing operation.

5,179,824

DISPOSABLE GRASS CATCHER

Ivo B. Ridge, 5805 Old Ranch Rd., Riverside, Calif. 92504, and George Spector, 233 Broadway Rm. 3815, New York, N.Y. 10007

Filed Jul. 26, 1991, Ser. No. 736,423
Int. Cl.[5] A01D *34/70*
U.S. Cl. 56—202 **1 Claim**



1. An improved grass catcher for a lawn mower having a housing with a grass discharge area, and a U-shaped handle, said grass catcher comprising:

a) an adapter having a flange at one end and another end attachable to the grass discharge area of the housing;

b) a disposable bag having a mouth mountable to the flange of said adapter so that said bag can catch cut grass travelling through the grass discharge area of the housing and said adapter;

c) means for supporting said disposable bag from the handle of the lawn mower so that said disposable bag will not drag on the ground surface when a person is operating the lawn mower;

d) said disposable bag having a plurality of perforations to allow air to pass therethrough while allowing the retainment of the cut grass therein;

e) a pull string about the mouth of said disposable bag for holding the mouth onto the flange and for sealing said disposable bag when said disposable bag is full of the cut grass and removed from said adapter; wherein said supporting means includes:

f) a plurality of support rods spaced apart with each affixed at one end to the U-shaped handle to extend downwardly on either side of said disposable bag;

g) a platform affixed to the other ends of said support rods under said disposable bag so that said disposable bag can rest upon said platform;

h) said adapter having an adjustable neck so as to position said grass catcher at an appropriate position above the ground surface; and

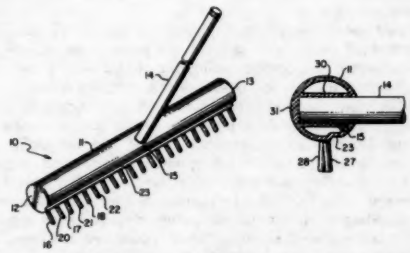
i) an elastic member extending between the handle and the housing so as to keep the handle and said grass catcher elevated when mowing and for lowering said grass catcher to a convenient position to remove said disposable bag therefrom.

5,179,825

SAND RAKE

Warren J. Griffiths, 18145 Solidad #87, Canyon Country, Calif. 91351, and Robert L. Gentile, 23412 Magic Mountain Pkwy., Unit 1103, Valencia, Calif. 91355

Filed Oct. 10, 1991, Ser. No. 774,326
Int. Cl.[5] A01D *7/06*
U.S. Cl. 56—400.05 **7 Claims**



1. A hand rake for smoothing a surface of granular material comprising the combination of:

an elongated base having opposite ends;

a handle carried on said base between said opposite ends;

a row of teeth outwardly projecting from said base extending between said base opposite ends and wherein said teeth are staggered in angular relationship with respect to alternate adjacent teeth; and

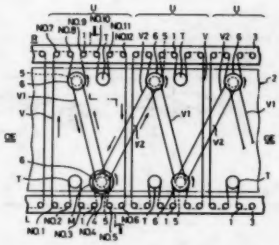
said base provided with an elongated groove extending between said opposite ends extending in parallel with and immediately above said row teeth.

5,179,826

UNIT DRIVING MECHANISM OF SPINDLES IN A SPINNING FRAME

Hironori Yasuda; Katumoto Yamamoto, both of Inazawa, and Osamu Yoshida, Gifu, all of Japan, assignors to Howa Machinery, Ltd., Aichi, Japan

Filed Aug. 30, 1990, Ser. No. 575,362
Claims priority, application Japan, Sep. 5, 1989, 1-229870
Int. Cl.[5] D01H *13/00*
U.S. Cl. 57—104 **4 Claims**



1. In a driving mechanism of spindles applied to a ring spinning frame, wherein spindle alignments arranged at right hand and left hand sides of said spinning frame are divided into a plurality of unit groups of spindles, each unit group of spindles being formed by a sub-group of spindles on said right hand side of said spinning frame and said sub-group of spindles of said left hand side facing each other, a plurality of driving mechanisms for driving spindles of said unit group of spindles being

provided aligned along a lengthwise direction of said spinning frame, each said unit driving mechanism being provided with an endless tape to drive spindles thereof, said right hand and left hand sides defining an open space therebetween,

wherein the improvement of each side driving mechanism comprises;

a driving motor having a motor shaft,

at least two driving wheels for driving said endless spindle tape,

one of said driving wheels being coaxially mounted on said shaft of said driving motor,

a driving pulley coaxially mounted on each of said driving wheels,

a plurality of tension pulleys for controlling tension of said endless tape,

at least one endless belt extending across said open space and mounted on each of said driving pulleys and drivingly connected to a corresponding one of said driving pulleys disposed at an opposing side of said spinning frame,

said driving wheels and said tension pulleys being alternately disposed at respective positions within said open space and close to a corresponding one of said sub-group of spindles at both sides of said spinning frame in said lengthwise direction such that each of said driving wheels disposed at one said side of said spinning frame faces a corresponding one of said tension pulleys disposed at an opposing side of said spinning frame positioned between an intervening space defined by two spindles, and

the number of said driving wheels is defined by the condition that the number of spindles driven by each of said driving wheels is no more than six in each said sub-group and one said drive wheel having one said pulley disposed thereon at one said side of said spinning frame includes one said endless tape mounted thereon that is in driving communication with a drive wheel and pulley disposed at an opposing side of said spinning frame.

5,179,827

ALTERNATE TWIST PLIED YARN

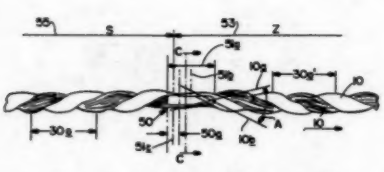
Otis B. Tinsley, Columbia, S.C., and Paul W. Yngve, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 322,624, Mar. 13, 1989, Pat. No. 5,012,636, which is a division of Ser. No. 188,589, Apr. 29, 1988, Pat. No. 4,873,821, which is a continuation-in-part of Ser. No. 181,847, Apr. 15, 1988, abandoned. This application May 3, 1991, Ser. No. 695,681

The portion of the term of this patent subsequent to Feb. 7, 2008, has been disclaimed.

Int. Cl.[5] D02G *3/28*

U.S. Cl. 57—204 **2 Claims**



1. An alternate twist plied yarn formed from a plurality of strands ply-twisted in alternating directions with a bond formed adjacent each reversal node wehrein a first half-cycle of ply-twist is located within the bond and a second half-cycle of ply-twist originates at one end of the bond and the bond consists of numerous individual spaced bonding sites between individual filaments, which sites are distributed throughout the bond.

5,179,828

SPINNING MACHINE HAVING A DOFFING ARRANGEMENT

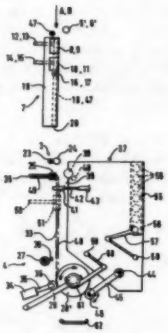
Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to One-half to Hans Stahlecker, Fed. Rep. of Germany

Filed Nov. 21, 1990, Ser. No. 618,082

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1989, 3938679

Int. Cl.[5] D01H *1/20, 15/00, 13/18*

U.S. Cl. 57—269 **22 Claims**



1. A spinning machine comprising:

a plurality of spinning positions for producing yarn, each spinning position being equipped with means for spinning two single yarns and for guiding the single yarns together to form a double yarn and with X-package forming means for forming an X-package with the double yarn,

doffing means including X-packing removing means for removing an X-package from a cradle of a spinning position and inserting means for inserting a tube in the cradle,

package size detecting means for detecting a predetermined degree of fullness of an X-package, and

spinning operation interrupting means for interrupting spinning operation at a spinning position in response to detection of a completed X-package by the package size detection means,

wherein the doffing means includes winding off means for winding-off of yarn previously wound on an X-package, yarn strengthening means for strengthening and connecting the two ends of the wound off double yarn to form a double yarn end, and rewinding means for rewinding the strengthened double yarn end back onto a predetermined location on the X-package as the final windings on the X-package.

5,179,829

COMBINED TEXTILE YARN SPINNING AND WINDING SYSTEM HAVING SPINNING TUBE TRANSPORTING MEANS

Hans Grecksch, and Frank Paetzold, both of Monchengladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst AG & Co., Monchengladbach, Fed. Rep. of Germany

Continuation of Ser. No. 538,249, Jun. 14, 1990, abandoned. This application Jan. 15, 1992, Ser. No. 821,854

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1989, 3919541; Mar. 21, 1990, 4008990

Int. Cl.[5] D01H *9/10, 9/00*

U.S. Cl. 57—281 **8 Claims**

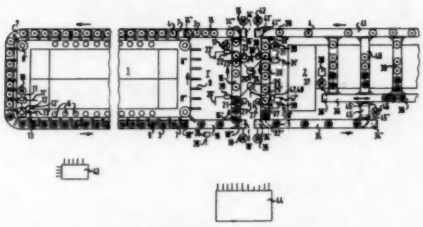
1. A combined textile yarn spinning and winding system comprising a yarn spinning machine, a yarn winding machine having a plurality of winding stations, and means for transporting spinning tubes between said spinning and winding machines by means of independent tube support members remov-

ably supported on said transporting means, said transporting means including:

(a) a first set of said independent tube support members specifically associated only with said spinning machine,

(b) a second set of said independent tube support members specifically associated only with said winding machine,

(c) means defining a first closed transport loop extending in a continuous path encircling said spinning machine for transportation of said first set of tube support members associated with said spinning machine in said continuous path,



(d) a second closed transport loop extending in a continuous path encircling said winding stations of said winding machine for transportation of said second set of tube support members associated with said winding machine in said continuous path, and

(e) means for removing spinning tubes from said first set of tube support members in said first closed transport loop and transferring said spinning tubes to said second set of tube support members in said second closed transport loop.

5,179,830

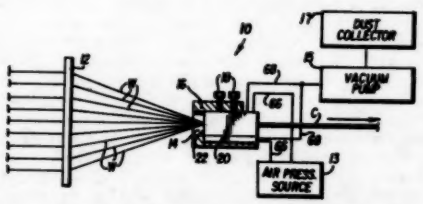
APPARATUS FOR CLEANING STRANDED CABLE

Steven M. Donath, Wayne County, Ill., assignor to Southwire Company, Carrollton, Ga.

Filed Feb. 28, 1991, Ser. No. 661,941

Int. Cl.[5] D01H *11/00*; A47L *5/38, 5/14*

U.S. Cl. 57—305 **17 Claims**



1. Apparatus for in-line cleaning during manufacture of stranded cable formed from a plurality of wires comprising:

a cleaning tube defining a passage through which the cable moves longitudinally;

at least one pressure chamber and at least one vacuum chamber connected to said cleaning tube;

a source of pressurized air connected to said pressure chamber;

a source of vacuum connected to said vacuum chamber;

port means communicating said pressure chamber with said cleaning tube for impinging jets of air from the pressurized air source on the cable as it moves along the cleaning tube passage and for entraining dust cleaned from the cable, said entraining occurring directly into air from said jets; and

means communicating said vacuum chamber with said cleaning tube for withdrawing air and entrained dust from the cleaning tube.

5,179,831

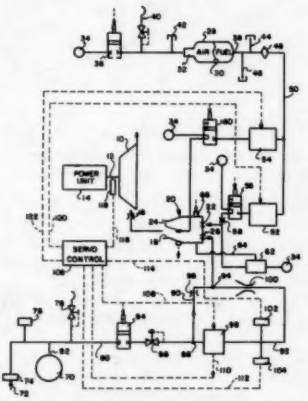
STORED ENERGY SYSTEM FOR DRIVING A TURBINE WHEEL

Steven Lampe, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 31, 1990, Ser. No. 561,093

Int. Cl.[5] F23R *3/26*; F02C *7/27*

U.S. Cl. 60—39.142 **5 Claims**



1. A stored energy system for providing hot gases to drive a turbine wheel comprising:

a turbine wheel adapted to rotate about an axis;

a nozzle in proximity to said turbine wheel for directing motive gases thereagainst;

a combustor having an outlet connected to said nozzle;

means for directing fuel into said combustor;

an oxidant storage vessel having an outlet;

a pressure controlling valve on said vessel outlet;

an oxidant inlet to said combustor;

a first fluid flow path, including a choked orifice, extending from said pressure controlling valve to said oxidant inlet; and

a second fluid flow path including a fluid flow control valve extending from said pressure controlling valve to said oxidant inlet.

5,179,832

AUGMENTER FLAME HOLDER CONSTRUCTION

William K. Barcza, Stuart, and Steven M. Kessell, West Palm Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 26, 1991, Ser. No. 736,558

Int. Cl.[5] F02K *3/10*

U.S. Cl. 60—261 **10 Claims**

1. A flameholder construction for a gas turbine engine having an axial airflow, an augmenter, and a fuel spray ring comprising:

a circumferential gutter located immediately downstream of said spray ring;

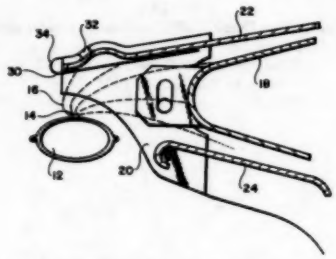
a circumferential inner shroud located radially inside of said gutter;

a circumferentially outer shroud located radially outside of said gutter, the area between said inner shroud and said outer shroud comprising the zone of said gutter;

said shrouds arranged to confine fuel from said spray ring and a portion of the airflow to the zone of said gutter;

a plurality of support braces welded to one shroud, of said

inner shroud and said outer shroud, at circumferentially spaced locations, the circumferential space between adjacent support braces comprising an area between said support braces; and



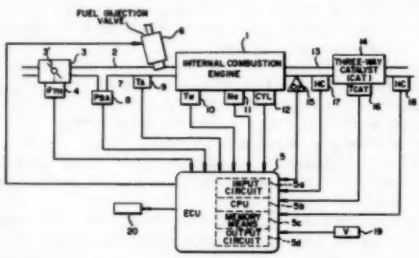
a splash shield secured to said one shroud and interposed between said one shroud and said fuel spray ring in the area between said support braces.

5,179,833

SYSTEM FOR DETECTING DETERIORATION OF A THREE-WAY CATALYST OF AN INTERNAL COMBUSTION ENGINE

Shigetaka Kuroda, and Yoichi Iwata, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1991, Ser. No. 717,247
Claims priority, application Japan, Aug. 28, 1990, 2-226250
Int. Cl.[5] F01N *3/20*
U.S. Cl. 60—276 **8 Claims**



1. A system for detecting deterioration of a three-way catalyst of an internal combustion engine having an exhaust passage, said three-way catalyst being arranged in said exhaust passage for purifying noxious components present in exhaust gases, said system comprising:

a first HC sensor arranged in said exhaust passage at a location upstream of said three-way catalyst for detecting concentration of hydrocarbons present in exhaust gases and providing a first output signal substantially proportional to the concentration of hydrocarbons at said upstream location;

a second HC sensor arranged in said exhaust passage at a location downstream of said three-way catalyst for detecting concentration of hydrocarbons present in exhaust gases and providing a second output signal substantially proportional to the concentration of hydrocarbons at said downstream location; and

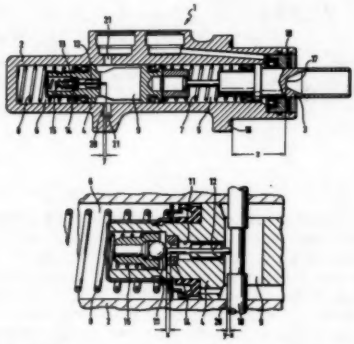
deterioration-determining means for comparing said first output from said first HC sensor with said second output from said second HC sensor and for determining from results of said comparison whether said three-way catalyst is deteriorated.

5,179,834

METHOD FOR SETTING THE DESIRED CLOSURE TRAVEL OF A HYDRAULIC CYLINDER CONTROL VALVE

Reinhard Rauschenbach, Langen, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 10, 1991, Ser. No. 683,398
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1990, 4011816
Int. Cl.[5] F16D *31/00*
U.S. Cl. 60—327 **6 Claims**



1. A method for setting a desired closure travel between a closing body and an associated valve seat in a central valve disposed in a piston displaceable in a housing of a brake master cylinder, the closing body but not the piston abutting a stop with the piston moving to a retracted position in said brake master cylinder housing as said master cylinder assumes an inoperative condition, through contact of said stop with a tip of an axial extension of said closing body, said axial extension extending axially opposite the direction of movement of said piston upon actuation of said master cylinder, said method including the steps of assembling substantially all the internal parts of said master cylinder including said piston except said stop, measuring the distance between said tip of said axial extension and a fixed point on said master cylinder housing against which said stop is to be axially located, with the internal parts caused to assume positions corresponding to said inoperative condition of said master cylinder, in which said piston moves to said retracted position, and selecting a stop having a characteristic dimension between the points of contact with said extension and said fixed point which is a function of said measured distance such that the desired closure travel of said closing body is established after installation of said stop in said housing located against said fixed point by abutment of said tip of said axial extension but not said piston against said stop.

5,179,835

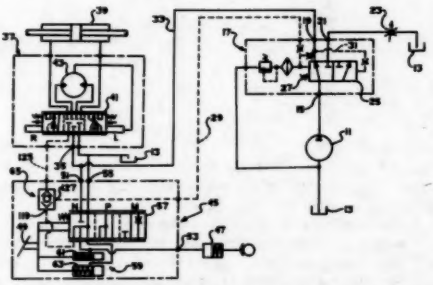
BRAKE VALVE FOR USE IN LOAD SENSING HYDRAULIC SYSTEM

Todd A. Casey, Victoria, Minn., and Alan D. Jackson, Halstead, Kans., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 15, 1991, Ser. No. 745,628
Int. Cl.[5] F16D *31/02*
U.S. Cl. 60—386 **10 Claims**

1. A brake valve for use in a hydraulic system of the type including a source of pressurized fluid, and means operable to very the fluid output of the source in response to a system load signal; a priority hydraulic circuit connected to receive pressurized fluid from the source, in parallel with said brake valve, the priority hydraulic circuit including means operable to

generate a priority load signal representative of the demand for fluid by the priority hydraulic circuit; and brake valve being of the type including housing means defining a fluid inlet port adapted to be connected to the source of pressurized fluid, a work port adapted to be connected to a fluid pressure operated brake actuator, a return port adapted to be connected to a system reservoir, and a valve bore interconnecting said fluid inlet port, said work port, and said return port; a valve spool reciprocable in said valve bore and having an end extending outside said housing means for forcible, manual reciprocation of said valve spool; said valve spool having a neutral position blocking fluid communication from said fluid inlet port to said work port, a power brake position permitting fluid communication from said inlet port to said workport, and a manual brake position in which a piston assembly is operable to generate fluid pressure at said work port, in response to movement



of said valve spool, and in the absence of pressurized fluid at said fluid port; characterized by:

(a) said housing means defines a brake load signal chamber adapted to be connected to the system load signal;

(b) said valve spool, in said neutral position, blocks fluid communication between said work port and said brake load signal chamber, and permits fluid communication between said brake load signal chamber and said return port;

(c) said valve spool, in said power brake position, blocks fluid communication between said brake load signal chamber and said return port, and permits fluid communication between said work port and said brake load signal chamber; and

(d) said valve spool, in said manual brake position, blocks fluid communication between said work port and said brake load signal chamber.

5,179,836

HYDRAULIC SYSTEM FOR A DIFFERENTIAL PISTON TYPE CYLINDER

Jörg Dantlgraber, Lohr-Sackenbach, Austria, assignor to Mannesmann Rexroth GmbH, Lohr/Main, Fed. Rep. of Germany

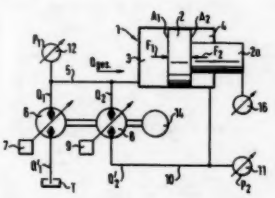
Filed Mar. 15, 1991, Ser. No. 670,303

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1990, 4008792

Int. Cl.[5] F15B *11/08, 13/09*

U.S. Cl. 60—430 **5 Claims**

1. A hydraulic system for a hydraulic cylinder of the differential piston type, comprising pump means for delivering fluid from a reservoir to the cylinder chamber which volume increases when the piston moves, wherein the fluid displaced from the opposite cylinder chamber is pressurized to build up a counter-pressure in this cylinder chamber to provide a hydraulic bias to said piston, characterized in that the pump means comprises a first variable displacement pump and a second variable displacement pump, both cylinder chambers being connected to each other via said first variable displacement pump and that the cylinder chamber larger in volume is connected to said reservoir via said second variable displacement pump, and means for adjusting the delivery volume of said second variable displacement pump relative to said first variable displacement pump in response to a predetermined speed of said piston so that (1) the volume of said second variable displacement pump delivers to the larger volume chamber is larger than the volume determined by the differen-



tial area between the cylinder chamber volumes when the piston moves toward the lower volume chamber, and (2) delivers a smaller volume to the larger volume chamber when said second variable displacement pump returns fluid from the larger volume chamber to the reservoir when the piston moves in the opposite direction.

5,179,837

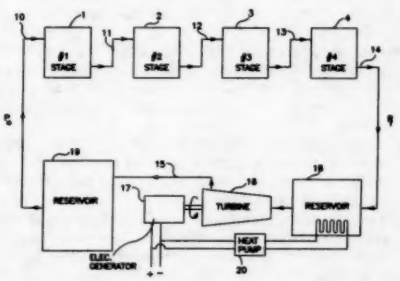
WAVE POWERED ENERGY GENERATOR

J. D. Sieber, 10 Elena Ct., Georgetown, Ontario, Canada L7G 4Z2

Filed Apr. 2, 1991, Ser. No. 679,106

Int. Cl.[5] F03B *13/12*

U.S. Cl. 60—500 **23 Claims**



1. A method of generating energy from the motion of waves upon the surface of a body of water comprising:

conveying a fluid through a series of at least two stages; and

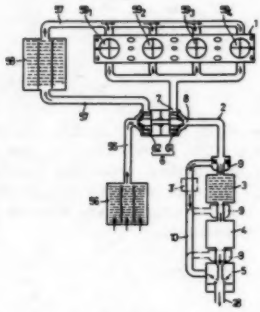
incrementally increasing the pressure on the fluid as the fluid passes by means of a differential pressure, between successive stages from an initial pressure input at an initial stage to a final pressure output at a final stage, the output from a preceding stage being input to the succeeding stage in series, the fluid pressure in each stage being incrementally increased in a compression chamber by means of relative movement between a first and an associated second member of the stage which form said compression chamber, said first member being at least partially immersed in the body of water and including a buoyant float member for floating on said surface and thereby rising and falling with the rise and fall of wave motion, said second member, in use, being positioned beneath said surface and slidably carrying a conduit extending into said compression chamber, the degree of movement of the first member in response to the motion of waves being greater than the degree of movement of the second member.

5,179,838

APPARATUS FOR DRIVING TURBO SUPERCHARGER

Yoshiaki Kakuta, 1-8-1, Hamakawado, Kasukabe-Shi, Saitama-Ken, Japan

Filed Dec. 26, 1990, Ser. No. 634,336
Claims priority, application Japan, Dec. 28, 1989, 1-342769
The portion of the term of this patent subsequent to May 26, 2009, has been disclaimed.
Int. Cl.[5] F02B *33/44*
U.S. Cl. 60—605.1 4 Claims



1. An apparatus for driving a turbo supercharger for an internal combustion engine having at least one combustion chamber, an inlet and an outlet for said at least one combustion chamber, and an exhaust gas conduit having an upstream end connected to said at least one combustion chamber outlet and a downstream end, comprising:

an exhaust gas turbine having an inlet and an outlet;

a supercharging compressor connected to said exhaust gas turbine to be driven thereby and having an inlet and an outlet;

said exhaust gas turbine inlet being connected to said exhaust gas conduit downstream of said at least one combustion chamber outlet so that said exhaust gas turbine is positively driven by the exhaust gas flow in said exhaust gas conduit;

a downstream portion of said exhaust gas conduit disposed between said exhaust gas turbine and said downstream end of said conduit and having an upstream end connected to said exhaust gas turbine outlet;

a negative pressure generator in said portion of said exhaust gas conduit downstream of said exhaust gas turbine outlet so that exhaust gas flows through said negative pressure generator;

a discharger outlet in said negative pressure generator for discharging exhaust gas flowing therethrough to the atmosphere;

gas accelerating means in said negative pressure generator for accelerating the exhaust gas flow to produce a strong negative pressure;

a suction chamber in said negative pressure generator communicating with said gas accelerating means so that said gas accelerating means produces a negative pressure in said suction chamber;

a suction duct having a downstream end connected to said suction chamber and an upstream end connected to said portion of said exhaust gas conduit downstream of said exhaust gas turbine outlet and upstream of said negative pressure generator for sucking exhaust from said exhaust gas turbine outlet through said suction chamber; and

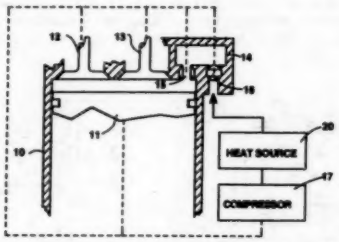
intake air conduit means having a first portion connected to said supercharging compressor inlet and a second portion connected between said supercharging compressor outlet and said at least one combustion chamber inlet, so that said exhaust gas turbine is driven positively by said exhaust gas pressure flowing through said exhaust gas conduit and by said negative pressure generated in said negative pressure generator for driving said supercharging compressor to supercharge intake air to said at least one combustion chamber.

5,179,839

ALTERNATIVE CHARGING METHOD FOR ENGINE WITH PRESSURIZED VALVED CELL

Joseph B. Bland, P.O. Box 1097, Solvang, Calif. 93463

Filed Feb. 6, 1990, Ser. No. 475,824
Int. Cl.[5] F02B *19/18*
U.S. Cl. 60—712 12 Claims



1. A method for efficiently transferring compressed gas into a heat engine which has cyclically-occurring changes in internal gas pressure comprising the steps of:

a. maintaining a quantity of compressed gas within a cell which is in immediate proximity to a heat engine expander undergoing cyclical changes in internal gas pressure while the heat engine expander has an internal gas pressure that is cyclically lower than the pressure of the compressed gas within the cell;

b. pressurizing a gas in the heat engine expander by compression or by heating or by some combination of compression and heating;

c. opening communication between the expander and the cell when the expander's increasing internal gas pressure cyclically matches substantially the pressure of compressed gas within the cell;

d. opening communication between the cell and a compressed gas source when expansion in the heat engine expander cyclically lowers the cell's internal gas pressure to match the pressure of the compressed gas source;

e. transferring an amount of the compressed gas from the compressed gas source into the cell at substantially constant pressure at the same time the gas contained by the cell is exhausted from the cell and into the heat engine expander at substantially constant pressure as a result of continued expansion in the heat engine expander;

f. closing communication between the cell and the heat engine expander when substantially all of the previous charge of gas within the cell has been displaced with the new charge of compressed gas flowing from the compressed gas source;

g. closing communication between the valved cell and the compressed gas source at effectively the same moment that communication is closed between the valved cell and the heat engine expander, and

h. cyclically repeating steps a–g.

5,179,840

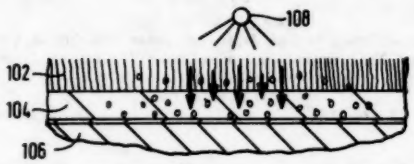
CRYOGENIC TREATMENT METHODS

Jonathan P. Worsfold, Horsham, England, assignor to The BOC Group plc, Windlesham, England

Filed Oct. 11, 1990, Ser. No. 595,896
Claims priority, application United Kingdom, Oct. 16, 1989, 8923260; May 31, 1990, 9012181
Int. Cl.[5] F25D *17/02*
U.S. Cl. 62—64 10 Claims

1. A method treating an article having a fabric surface,

comprising spraying the surface with liquid cryogen and then removing dead mites from the freshly sprayed fabric, in which



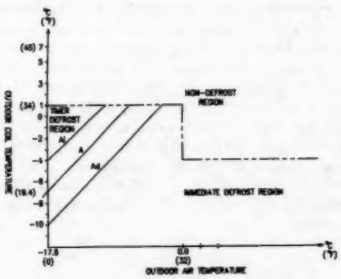
the mites are removed from each region of the surface within 1 minute of that region being sprayed.

5,179,841

HEAT RECLAMATION FROM AND ADJUSTMENT OF DEFROST CYCLE

Thomas R. Phillips, Cicero; Thomas L. Dewolf, Liverpool, and Ronald W. Bench, Cicero, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 22, 1991, Ser. No. 673,447
Int. Cl.[5] F25B *41/00*
U.S. Cl. 62—81 **6 Claims**



1. A method of adjusting a defrost region curve for determining the initiation of a next subsequent defrost cycle for removing accumulated frost from an outdoor heat exchanger coil including an outdoor fan forming a portion of a refrigerant heat pump system comprising the steps of:

initiating a defrost cycle upon comparing the comparison between outdoor ambient temperature and outdoor heat exchanger coil refrigerant temperature with a defrost initiation reference level curve:

terminating said defrost cycle;

determining the length of time of said defrost cycle;

adjusting the defrost initiation reference level curve for the initiation of the next subsequent defrost cycle when said defrost cycle is outside a predetermined time period; and

operating a heat reclaim cycle, with the outdoor fan deenergized until the outdoor heat exchanger coil refrigerant temperature reaches a predetermined temperature.

5,179,842

INVERTER CONTROLLED AIR CONDITIONER CAPABLE OF EFFECTIVELY REDUCING A RUSH CURRENT AT STARTING

Hidetoshi Kanazawa, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 29, 1992, Ser. No. 889,988
Claims priority, application Japan, May 31, 1991, 3-129549
Int. Cl.[5] H02P *1/00*; F25B *49/00*
U.S. Cl. 62—158 **7 Claims**

1. An inverter controlled air conditioner comprising:

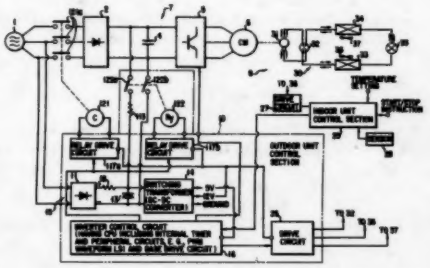
an inverter including a rectifying circuit having AC input terminals and DC output terminals, a smoothing capacitor connected to said DC output terminals of said rectifying circuit, and a switching circuit, connected to two terminals of said smoothing capacitor, for outputting a signal having a predetermined frequency which is capable of being changed in accordance with a control signal;

a compressor motor driven by the signal having the predetermined frequency which is output from said switching circuit;

an electromagnetic contactor having normally-open contactor contacts connected between said AC input terminals of said rectifying circuit and an AC power supply, and an electromagnetic contactor body for energizing to close said contactor contacts in accordance with a drive signal;

an air conditioner body having a compressor driven by said compressor motor, a refrigerating cycle for circulating a refrigerant between outdoor and indoor heat exchangers by said compressor, and an indoor unit control section for outputting an operation command of said refrigerating cycle;

an outdoor unit control section having an auxiliary power supply circuit, connected to said AC power supply, for obtaining a plurality of DC operation voltages, first and second relay drive circuits to which said plurality of DC operation voltages are applied from said auxiliary power supply circuit, and an inverter control circuit, said inverter control circuit having control means for supplying



the control signal to said inverter in response to an operation command from said indoor unit control section and controlling said first and second relay drive circuits to operate at predetermined timings, and said first relay drive circuit being connected to said electromagnetic contactor body to provide the drive signal when said air conditioner is started; and

rush current preventing relay means having at least one normally-open contact connected between said two terminals of said smoothing capacitor of said inverter and a predetermined output terminal of said auxiliary power supply circuit, and a relay body for energizing to close said normally-open contact in accordance with a drive signal from said second relay drive circuit, wherein

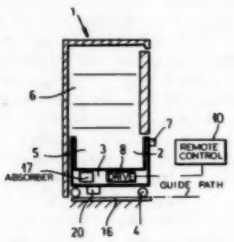
said control means of said inverter control circuit enables said second relay drive circuit upon reception of a start command from said indoor unit control section and thereafter enables said first relay drive circuit, so that said smoothing capacitor of said inverter is charged in advance by an operation voltage from said auxiliary power supply circuit and thereafter an AC power supply voltage from said AC power supply is applied to said inverter, thereby preventing a rush current from flowing to said smoothing capacitor when said inverter controlled air conditioner is started.

5,179,843

REMOTE CONTROLLED ROBOTIC REFRIGERATOR

Helge S. Cohausz, Schumannstrasse 97, D 4000 Düsseldorf 1, Fed. Rep. of Germany

Filed Sep. 12, 1991, Ser. No. 758,698
Int. Cl.[5] F25D *15/00*
U.S. Cl. 62—237 **7 Claims**



1. A remote controlled robotic refrigerator system comprising:

remote control means for transmitting a signal;

a refrigerator spaced from said control means and comprising:

a housing having a bottom formed with an opening,

a movable carriage received in said opening and formed with a refrigerated reception compartment,

a drive on said carriage, and

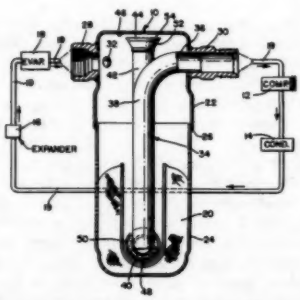
means on said carriage for receiving said signal and for actuating said drive, said carriage being controllably driven out of said opening along a path outside said housing toward said remote control means and being retracted back into said opening in response to said signal.

5,179,844

LIQUID ACCUMULATOR

Tommy L. Lyman, Piqua, and Kenneth B. Newman, Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 16, 1991, Ser. No. 730,760
Int. Cl.[5] F25B *43/00*
U.S. Cl. 62—503 **2 Claims**



1. In an air conditioning system liquid refrigerant accumulator of the type comprising a canister having a top, bottom and side wall with a generally U-shaped pipe inside said canister through which refrigerant in gaseous form is drawn, said pipe having an outlet end opening through said side wall and an inlet end, the improvement comprising,

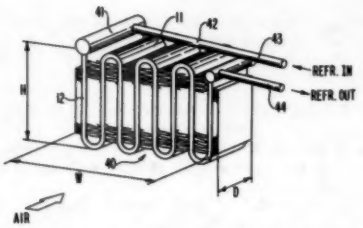
said inlet end having a flared, trumpet shape opening in a direction toward said canister top, said inlet end also having a rim located sufficiently close to said top so as to restrict the entry of liquid refrigerant thereto but sufficiently far therefrom so as to allow free flow of gaseous refrigerant thereto.

5,179,845

HEAT EXCHANGER

Kenichi Sasaki, Isesaki, Japan, and Janusz Sokolowski, Garland, Tex., assignors to Sanden Corporation, Gunma, Japan

Filed Jun. 19, 1991, Ser. No. 717,476
Int. Cl.[5] F25B *39/02*
U.S. Cl. 62—515 **12 Claims**



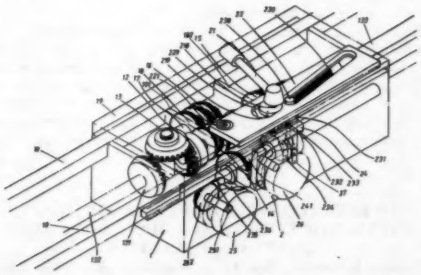
1. In a serpentine type evaporator for use in a refrigeration circuit, said evaporator comprising a serpentine flat tube including a plurality of spaced essentially parallel planar portions and a plurality of bent portions, fins interposed between opposed outer surfaces of said serpentine flat tube, an inlet header pipe connected to one end of said serpentine flat tube, an inlet pipe connected to said inlet header pipe, an outlet header pipe connected to the other end of said serpentine flat tube and an outlet pipe connected to said outlet header pipe, the improvement comprising at last one of said inlet pipe and said outlet pipe being connected to its corresponding header pipe in a direction both perpendicular to said inlet header pipe or said outlet header pipe to which it is attached, and in a plane parallel to the fins.

5,179,846

CLOTH WINDING DEVICE FOR CIRCULAR KNITTING MACHINE

Chin-Yung Lin, No. 57, Wu Chone 7th Rd., Wu Gu Industry Area, Wu Gu hsiang, Taipei hsien, Taiwan

Filed Oct. 30, 1990, Ser. No. 605,338
Int. Cl.[5] D04B *15/88*
U.S. Cl. 66—149 R **10 Claims**



1. A cloth winding device for a circular knitting machine comprising a base, and a swivel frame having support rods, a left side and a right side;

a case positioned on said support rods and housing gear means having coarse gears for receiving an input rotation and fine gears for rotating a cloth tensioning shaft, said fine gear including a plurality of fine adjustment gears secured on said cloth tensioning shaft, and adjustment

means for selective coupling together one of said course gears and one of said fine gears for rotating said cloth tensioning shaft at different speeds relative to said input rotation;

said course gears including a sleeve, a plurality of coarse adjustment gears secured to said sleeve, and a plurality of adjacent rear row reduction gears respectively meshing with said plurality of coarse adjustment gears, a first bevel gear on an end of said sleeve, a second bevel gear meshing with said first bevel gear and providing said input rotation, and a third bevel gear attached to a cloth winding shaft and meshing with said second bevel gear; said cloth winding shaft and said cloth tensioning shaft being coaxially arranged;

a driving roller coupled to and driven by said cloth winding shaft;

a set of rollers coupled to and driven by said driving roller, set of rollers mounted between said left and right sides of said swivel frame;

a rocking arm having a first end attached to a cloth roller and a second end protruding into said swivel frame and pivotally connected to a supporting shaft mounted in said swivel frame;

said cloth roller coupled to and driven by one roller of said set of rollers through a first belt and receiving a knitted cloth thereabout; and

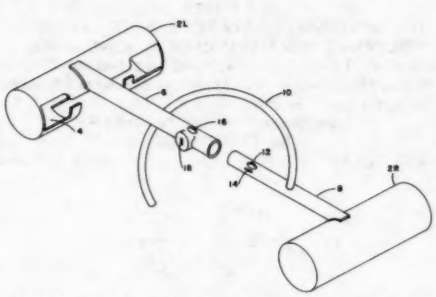
a tension adjustment means mounted on said swivel frame mounted and secured to an extension element extending from said second end of said rocking arm for controlling a knitted tightness of said knitted cloth.

5,179,847

SKATEBOARD SECURITY DEVICE

Bryan B. Dorn, 1400 E. Central Ave., Fullerton, Calif. 92631

Filed Jun. 29, 1992, Ser. No. 906,061
Int. Cl.[5] E05B *73/00*
U.S. Cl. 70—18 **5 Claims**



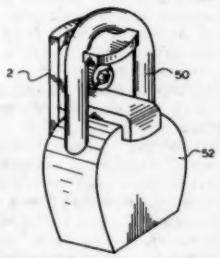
1. A skateboard security device comprising a pair of axially slotted cylindrically shaped closed-end body structures of sufficient diameter to encompass a truck of said a skateboard, each body structure having a single rigid tube, dimensioned such that one tube will fit within the other, attached normal to the midpoint of the body structure; each rigid tube having an aperture of sufficient diameter to allow the insertion of the free end of a locking cable when the two rigid tubes are in conjunction and the apertures are in alignment; the rigid tube of lesser diameter having attached a locking cable of sufficient length to loop around a fixed structure, and the rigid tube of greater diameter having locking means adjacent to the corresponding aperture.

5,179,848

LOCK HOLDING DEVICE

Thomas E. Kief, 320 Tuxedo La., Cary, Ill. 60013

Filed Jun. 8, 1992, Ser. No. 899,871
Int. Cl.[5] E05B *67/38*
U.S. Cl. 70—51 **1 Claim**



1. A lock holder device for attaching padlocks having a shackle and a body portion to motorcycles while the locks are not in use, said lock holder comprising:

a first lock engaging member comprising a middle section having a hole therein, an upper section having sides defined thereon, and a lower section, wherein said upper section extends at a transverse angle from said middle section and has symmetrical grooves on said sides thereof for engaging the shackle of the padlock, and wherein said lower section extends at a transverse angle from said middle section and has a lip thereon extending downwardly from said lower section at a transverse angle for securing the body portion of the padlock;

a second lock engaging member having a hole therein for securing said second lock engaging member to said first lock engaging member and to a motorcycle, and having a lip extending downwardly therefrom as an extension of said second lock engaging member for securing the body portion of the padlock; and

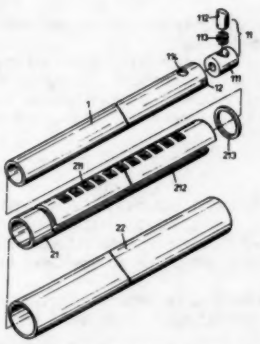
fastening means for securing said first lock engaging member and said second lock engaging member to each other and to a motorcycle.

5,179,849

STEERING WHEEL LOCK FOR AUTOMOBILE

Mao-Hsiung Wang, Tainan Hsien, Taiwan, assignor to Cheeng Iu Industrial Co., Ltd., Chia-yi, Taiwan

Filed May 21, 1991, Ser. No. 703,733
Int. Cl.[5] B60R *25/02*
U.S. Cl. 70—209 **4 Claims**



1. An improved steering wheel lock for an automobile comprising:

(a) a longitudinally extending latch tube defined by an inner longitudinally directed tubular member concentrically located within an outer longitudinally directed tubular member, said inner tubular member having a plurality of longitudinally aligned openings passing through a sidewall thereof, said inner tubular member having (1) a pair of longitudinally extending troughs formed within said sidewall of said outer tubular member, said troughs being located on opposing sides of said aligned openings, (2) an arcuate trough disposed adjacent a first end of said inner tubular member and extending circumferentially between said pair of longitudinally extending troughs, and (3) a circular recess defined between an annular ring disposed within said outer tubular member and a second end of said inner tubular member;

(b) a sliding rod member having a lock cylinder fixedly secured to one end of said sliding rod member, said sliding rod being insertable within said inner tubular member and having a protuberance extending from a sidewall thereof for sliding engagement within one of said troughs, said lock cylinder having a spring biased lock cylinder pin member for insert into one of said aligned openings for longitudinal adjustment of the length of said latch tube and said sliding rod member, said sliding rod member being rotatable within said outer tubular member when said protuberance is engaged within said circular recess for substantially preventing said lock cylinder pin from engaging any of said aligned openings, whereby said sliding rod member can subsequently be extended from said latch tube without operation of said lock cylinder.

5,179,850

MAGNETIC LATCHKEY

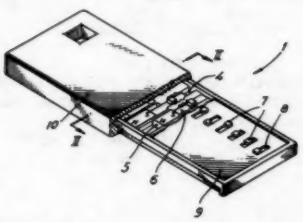
Juan Capdevila Mas, Ctra. de Torello s/n., 08572 Sant Pere De Torello, Barcelona, Spain

Filed Oct. 29, 1990, Ser. No. 604,937

Claims priority, application Spain, Oct. 30, 1989, 8903937; Jul. 20, 1990, 9001971

Int. Cl.[5] E05B *47/00*

U.S. Cl. 70—276 **16 Claims**



1. A magnetic latch arrangement comprising:

a latchkey body; and

a plurality of magnets movably contained in said latchkey body and each of said plurality of magnets movable into a plurality of positions with respect to said latchkey body,

a lock having a recess means for receiving said latchkey body.

5,179,851

CROWN ADJUSTMENT CONTROL SYSTEM FOR CLUSTER MILLS

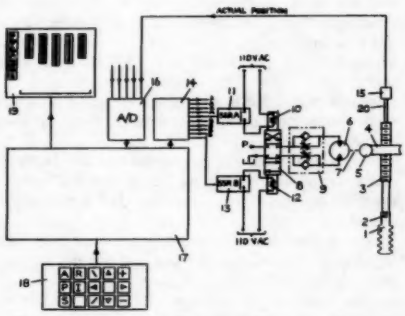
John W. Turley, Oxford, and Michael G. Sendzimir, Woodbury, both of Conn., assignors to T. Sendzimir, Inc., Westbury, Conn.

Filed Dec. 14, 1990, Ser. No. 628,221

Int. Cl.[5] B21B *37/08, 31/22, 31/34*

U.S. Cl. 72—7 **5 Claims**

1. In a cluster mill of the type having spaced-apart, opposing upper and lower clusters, each of said clusters having work rills, intermediate rolls, and backing bearings, wherein positioning of said work rolls defines a roll gap therebetween, said upper and lower clusters having a plurality of individual drives, each of said drives being capable of causing positional movement independent of one another, each of said drives being used to position one of a plurality of racks, the movement of said racks tending to shape at least one of a plurality of backing shafts each of which is supported at a plurality of locations along its length by saddles, the movement of said racks also shaping the roll gap, a crown adjustment control



system having computer-controlled means for causing and controlling simultaneous movement of at least two of said drives in unison in accordance with at least one predetermined equation defining the position of the racks so as to produce a profile form of the roll gap which can be varied by the movement of said plurality of racks, thus defining a plurality of variable profile forms, wherein said profile forms comprise a plurality of crown forms of varying curvatures, and comprising means for making adjustments to the positions of selected individual racks, said adjustments being preserved during any change to the profile form of the roll gap.

5,179,852

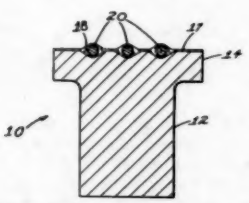
HIGH-INTENSITY ROTARY PEENING PARTICLE SUPPORT AND METHOD OF MAKING SAME

Michael W. Lovejoy, Prescott, Wis., and Jennifer L. Trice, Eagan, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 6, 1991, Ser. No. 788,498

Int. Cl.[5] C21D *7/06*

U.S. Cl. 72—53 **24 Claims**



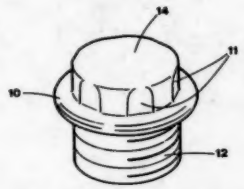
1. An improved high-intensity rotary peening particle support of the type having a plurality of peening particles metallurgically secured to an exposed surface thereof, wherein the improvement comprises the support having a base composition consisting essentially of from about 0.08 to about 0.34 weight percent C, the balance Fe, and a Ni-enriched layer extending below said exposed surface, said Ni-enriched layer having weight percent Ni greater than the base composition.

5,179,853

METHOD TO MANUFACTURE SEALING NIPPLES OR PLUGS

Bruno Nicoletti, Sasso Marconi, Italy, assignor to Lolli Valter, Di Reno, Italy

Filed Feb. 20, 1991, Ser. No. 658,318
Claims priority, application Italy, Feb. 21, 1990, 3352 A/90
Int. Cl.[5] B21D *53/24*
U.S. Cl. 72—333 **5 Claims**



1. A method of manufacturing sealing plugs comprising the steps of:

cutting a disk-shaped element from a metal sheet;

drawing said disk to obtain a hollow element of cylindrical shape, closed at one end by a cap;

inserting said hollow element between a die including a movable part and a stationary counter-die part, said stationary counter-die having a hole housing a punch that defines with respect to the peripheral surface of said hole, an annular seating into which said hollow element is inserted with said cap turned outward; toward said movable die part, said counter-die also having a groove surrounding said hole, said movable die part also having a cavity with a prismatic profile into which said cap fits,

moving said die parts relative to each other to press said hollow element so that said punch partially inserts into said movable die cavity to produce on said cap of said hollow element a series of facets with said prismatic profile, said pressing producing an axial compressing of said hollow element to fold said hollow element into said groove of said counter-die,

continuing said pressing to close said fold to form an outwardly extending annular crown on the outer peripheral surface of said hollow element below said prismatic profile of said cap; and

threading at least a portion of the free end of said hollow element below said crown starting from the open end of said hollow element.

5,179,854

PROCESS FOR PRODUCTION OF DRAW-IRONED CAN

Kenzo Matsui, Hirano, and Katsuhiro Imazu, Yokohama, both of Japan, assignors to Toy Seikan Kaisha Ltd., Tokyo, Japan

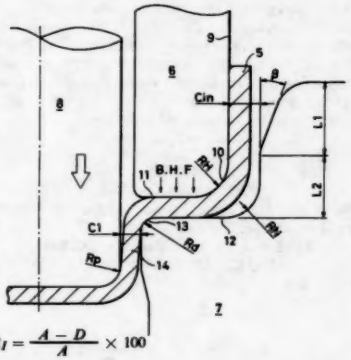
PCT No. PCT/JP90/00629, § 371 Date Mar. 13, 1991, § 102(e) Date Mar. 13, 1991, PCT Pub. No. WO90/14179, PCT Pub. Date Nov. 29, 1990
PCT Filed May 17, 1990, Ser. No. 635,504
Claims priority, application Japan, May 17, 1989, 1-121476
Int. Cl.[5] B21D *22/28*
U.S. Cl. 72—349 **4 Claims**

1. A process for the production of a draw-ironed can which comprises:

(i) draw-forming a metal sheet blank having a thickness A into a preliminarily drawn cup with a side wall having a maximum thickness B while controlling the increase in the thickness B up to 20% of the thickness A,

(ii) redrawing the preliminarily drawn cup into a deep-draw-formed cup having a diameter smaller than that of the preliminarily drawn cup, and with the side wall having a maximum thickness C while controlling the increase of the thickness C up to 30% of the thickness A, and

(iii) ironing the deep-draw-formed cup into a draw-ironed can with the side wall having a thickness D so that the total ironing ration R_I defined by the following formula:



$$R_I = \frac{A - D}{A} \times 100$$

is at least 40% and that the following requirements:

$(B-D)/B \times 100 \leqq 70\%$, and

$(C-D)/C \times 100 \leqq 70\%$

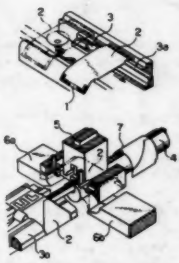
are satisfied.

5,179,855

FILM MAGAZINE FORMING APPARATUS

Toshio Kato; Yorikatu Miyazawa; Osamu Shibazaki, and Yoshihiko Goda, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Apr. 19, 1991, Ser. No. 688,045
Claims priority, application Japan, Apr. 26, 1990, 2-108829
Int. Cl.[5] B21D *51/26*
U.S. Cl. 72—401 **4 Claims**



1. A film magazine forming apparatus for forming a sheet having printing on a side thereof into an almost cylindrical shape, the film magazine forming apparatus comprising:

supply means for supplying sheet having a shape for forming into a film magazine;

transport means for transporting the sheet from the supply means;

forming means for forming the sheet into the almost cylindrical shape with the printing on the side of the sheet forming an outer cylindrical surface of the almost cylindrical shape, said forming means including:

a core mold, an upper mold, and first and second side molds; and

moving means for moving the upper mold and the first and second side molds to form the almost cylindrical shape around the core mold so that said upper mold and first and second side molds surround said core mold

when the transport means moves the sheet to a position between said molds;

the transport means transporting the sheet with the printed side of the sheet being out of contact with and facing away from the transport means; and

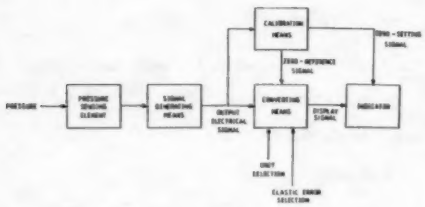
wherein the core mold extends beyond the surrounding relationship of said upper mold and said first and second side mold so that said core mold also acts as a guide for transporting the thus formed almost cylindrical shape film magazine when said magazine is entirely out of all of said molds to another operational position.

5,179,856

PRESSURE GAUGE

Roger M. C. Huang, Taipei, Taiwan, assignor to Bestek Electronics Corp., Taipei, Taiwan

Filed Apr. 18, 1991, Ser. No. 686,988
Int. Cl.[5] G01L *9/02, 27/00*
U.S. Cl. 73—4 R **11 Claims**



1. A pressure gauge comprising:

a pressure sensing member for sensing the gas pressure, said pressure sensing member including an elastic member having an elastic tolerance and a variable resistor, said variable resistor having a moving contact coupled to said elastic member such that the movement of said elastic member causes a displacement of said moving contact and whereby the resistance value of said variable resistor is adjusted;

means for generating a first signal, the first signal being indicative of the resistance value of said variable resistor;

calibrating means for presetting an initial output first signal generated by initial displacement of said moving contact of said variable resistor as a zero-reference signal before the gauged gas pressure is actually exerted to said pressure sensing member;

means for preselecting the value of the elastic tolerance of said elastic member;

means for generating a display control signal in accordance with the comparison of the first signal generated by the gauged gas pressure against the zero-reference signal and the value of the elastic tolerance of said elastic member; and

an indicator, responsive to the display control signal, for displaying the value of the gas pressure sensed by said pressure sensing member.

5,179,857

MONITORING SYSTEM FOR CYCLICALLY OPERATING MACHINES

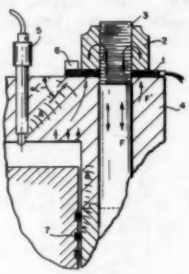
Hans Sonderegger, Neftenbach; Rolf Kuratle, Winterthur, and Peter Wolfer, Kleinandelfingen, all of Switzerland, assignors to Kistler Instrumente AG, Switzerland

Filed May 31, 1991, Ser. No. 709,026
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—117.3 **12 Claims**

1. Monitoring systems for cyclically operating machines having a cylinder comprising:

at least one sensor means mounted at a single measuring point on the exterior of said cylinder and including a force sensor for detecting force in said cylinder which is indicative of the pressure in said cylinder and an acceleration sensor for detecting structure-borne noise in said cylinder; and

computer means for storing pre-recorded force and structure-borne noise as a function of time in a cycle of said cylinder as a reference and for comparing said detected force and structure-borne noise and reference force and structure-borne noise to determine the status of said machine.

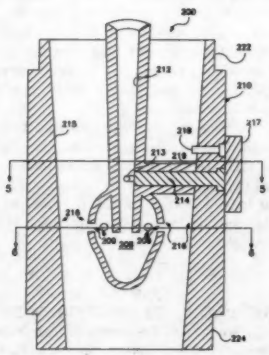


5,179,858

MASS AIR FLOW METER

Robert K. Atwood, 3450 John R. Rd., Rochester, Mich. 48307

Continuation-in-part of Ser. No. 524,581, May 17, 1990, Pat. No. 5,048,327. This application Sep. 17, 1991, Ser. No. 761,294
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—118.2 **6 Claims**



1. In a mass air flow meter for internal combustion engines having a hollow elongated body having a minimum cross-sectional area therein forming a venturi, a sample duct associated with said elongated body for receiving a flow of sample air therethrough, said sample duct being tapered in decreasing area in the direction of the air flow therethrough, the entire air source for the engine being split into a main flow path through said elongated body and into a sampling path through the sample duct, an air flow transducer disposed in said sample duct near the minimum cross-sectional area thereof, the flow through the sample duct downstream from said transducer being accumulated in a collecting chamber and the flow exiting from the latter passing through flow restriction means and then being recombined with the main flow of air through said elongated body, the improvement comprising:

(a) the collecting chamber being formed at the lower end of the sample duct so as to receive direct in-line flow therefrom;

(b) both the sample duct and the collecting chamber being supported within the interior of said elongated body centrally coaxially thereof;

(c) the exterior surface of said collecting chamber being an airfoil surface having a maximum external dimension so as to form, with the inside cross-sectional area of said elongated body, an inside-out venturi having a minimum annular cross-sectional throat area;

(d) the principal internal volume of said collecting chamber (for accumulation of sample air exiting from said sample tube) being disposed downstream from the location of the minimum throat area; and

(e) flow restriction means through the wall thickness of the collecting chamber body at the location of said minimum throat area, said flow restriction means serving as the outlet for the air accumulated in said collecting chamber.

5,179,859

METHOD OF SAMPLING, AND SAMPLING DEVICE

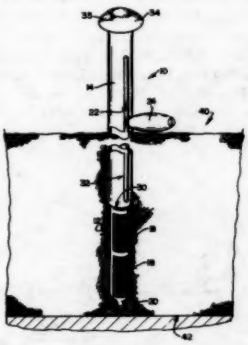
Johannes A. Van Niekerk, Caledon, South Africa, assignor to Caledon Riviersonderend Kooperasie Beperk, South Africa

Filed Feb. 26, 1991, Ser. No. 661,557

Claims priority, application South Africa, Mar. 16, 1989, 90/2058

Int. Cl.[5] G01N *1/12*

U.S. Cl. 73—864.64 **13 Claims**



1. A method of sampling grain offered in bulk, including inserting an empty, elongate container, which has a hollow interior in the form of a passage extending from a first end which will be a lower end in use to an opposed second end which is open and which will be an upper end in use, and elongate inlet means along its length and in communication with the passage, substantially vertically into the bulk of grain while covering the elongate inlet means;

uncovering in an axial direction the inlet means and exposing the interior of the container progressively from the bottom of the bulk upwardly to allow grain, correspondingly progressively, to flow into the container from a position toward the bottom of the bulk to a position upwardly spaced from the bottom of the bulk;

re-covering the inlet means;

withdrawing the container; and upturning the container into a repository to empty it via said passage and said open second end.

5,179,860

DEFECT DETECTING METHOD AND APPARATUS

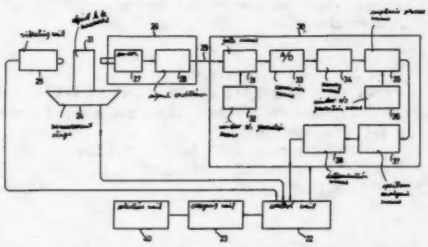
Kiyoshi Tsuboi, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd. and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 592,247, Oct. 3, 1990, abandoned. This application Feb. 24, 1992, Ser. No. 839,085

Claims priority, application Japan, Oct. 4, 1989, 1-259183

Int. Cl.[5] G01N *29/12*

U.S. Cl. 73—579 **7 Claims**



1. A method for detecting whether or not an object to be measured has a defect, said method comprising the steps of:

vibrating said object to be measured;

ceasing vibrating said object; then

picking up the vibration of the object; and

detecting whether or not a spectrum of the characteristic vibration of said object is separated into two portions to detect the presence of the defect in the object to be measured; and

wherein the step of detecting includes determining the width of the resonance of the spectrum.

5,179,861

DIAPHRAGM TYPE PRESSURE SENSOR

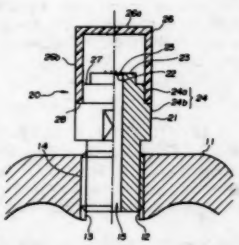
Nobuhiro Asano, Yokosuka, and Hiroshi Kobayashi, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 10, 1991, Ser. No. 639,268

Claims priority, application Japan, Jan. 17, 1990, 2-6304

Int. Cl.[5] G01L *7/08, 9/04*

U.S. Cl. 73—726 **24 Claims**



23. A pressure sensor comprising:

a transducer main body comprising a plate-shaped diaphragm having an inner side and an outer side, a mounting portion for mounting to a container for a fluid, a cylindrical diaphragm support having a top end supporting a periphery of said diaphragm, a trunk extending between said mounting portion and said diaphragm support and comprising a first cylindrical portion and a second cylindrical portion, the first cylindrical portion being disposed between said diaphragm support and said second cylindrical portion and having a smaller diameter than said second cylindrical portion and a larger diameter than said dia-

phragm support, and a hole of constant cross-section in said diaphragm support and said trunk and communicating with said inner side of said diaphragm for introducing a fluid from said container to said inner side of said diaphragm;

a transducing element for sensing deflection of said diaphragm affixed to the outer side of said diaphragm; and

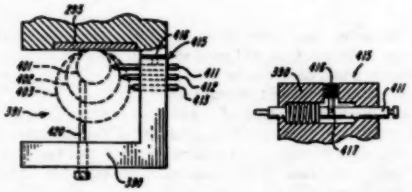
a cover for protecting said transducing element, said cover being fitted over said first cylindrical portion, wherein the difference between the diameter of said first cylindrical portion and the diameter of said diaphragm support is at least equal to the difference between the diameter of said second cylindrical portion and the diameter of said first cylindrical portion.

5,179,862

SNAP-ON FLOW MEASUREMENT SYSTEM

Lawrence C. Lynnworth, Waltham, Mass., assignor to Panametrics, Inc., Waltham, Mass.

Filed Jun. 29, 1990, Ser. No. 546,586
Int. Cl.[5] G01F *1/66*
U.S. Cl. 73—861.28 **33 Claims**



1. An assembly for launching or receiving ultrasonic signals in a flow measurement system that detects characteristics of fluid flowing in a conduit, such assembly comprising

a transducer means for transducing electrical and mechanical energy,

a transducer block having a body and means in said body for mounting the transducer means in a first defined position so as to determine a precise signal launching direction for mechanical energy coupled to or from the transducer means,

said body further including a channel extending therethrough and means located therein for automatically releasably engaging and resiliently biasing a conduit in a second defined position when the conduit is inserted in the channel, said first and second defined positions determining a precisely defined signal path for entry of signal energy into said conduit and calculation of propagation time of energy therein.

5,179,863

METHOD AND APPARATUS FOR SETTING THE GAP DISTANCE BETWEEN A MASK AND A WAFER AT A PREDETERMINED DISTANCE

Norio Uchida, Yokohama, and Nobutaka Kikuiri, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

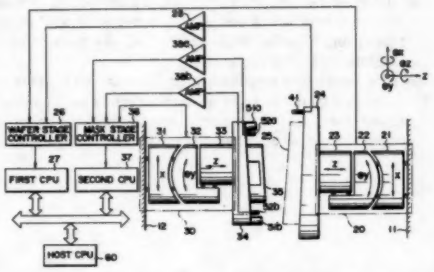
Filed Mar. 5, 1991, Ser. No. 664,850
Claims priority, application Japan, Mar. 5, 1990, 2-51681
Int. Cl.[5] B65G *43/00*
U.S. Cl. 73—865.8 **5 Claims**

1. A method for setting the gap distance between first and second objects at a predetermined distance so that the respective sample surfaces of the first and second objects are parallel to each other, comprising steps of:

(a) measuring an error in the parallelism of the sample surface of the second object with respect to an imaginary reference plane defined as a plane parallel to a direction in which the first object is transferred;

(b) tilting the second object so as to eliminate the error in the parallelism, thereby keeping the sample surface of the second object parallel to the reference plane;

(c) measuring an error in the parallelism of the sample surface of the first object with respect to the sample surface of the second object and the gap distance between the respective sample surfaces of the first and second objects; and



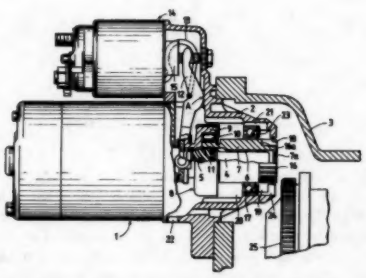
(d) tilting the first object so as to eliminate the error in the parallelism, thereby keeping the respective sample surfaces of the first and second objects parallel to each other, and adjusting the gap distance between the respective sample surfaces of the first and second objects, thereby setting the gap distance between the sample surfaces at the predetermined distance.

5,179,864

STARTER HAVING A CONTAMINANT-PROOF STRUTURE OF A SLIDING PORTION

Koki Ueta, Katsuta; Naoki Kamada, Mito; Hideo Mori; Suehiro Endo, both of Naka, and Susumu Tajima, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of, Japan

Filed May 15, 1990, Ser. No. 523,402
Claims priority, application Japan, May 24, 1989, 1-128777
Int. Cl.[5] F02N *11/02*
U.S. Cl. 74—7 A **15 Claims**



11. In a starter for an engine provided with a pinion shaft enclosed in a housing and having a pinion at one end, said pinion shaft being supported by a bearing and being slidable in an axial direction to project into a transmission casing through an opening of said housing and mesh with a ring gear inside said transmission casing when the engine is started, the improvement comprising:

an air reservoir defined between said bearing and said opening of said housing for storing air admitted therein through said opening; and

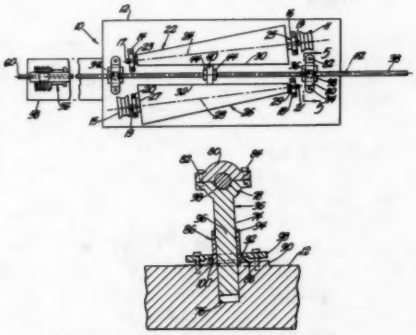
a communication passage for communicating said air reservoir with an exterior of said air reservoir.

5,179,865

INFINITELY VARIABLE TRANSMISSION

Richard J. Line, Sterling Heights, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 27, 1992, Ser. No. 825,894
Int. Cl.[5] F16H *15/20*
U.S. Cl. 476—51 6 Claims



1. An infinitely variable transmission, comprising:
a block;
a roller rotatably mounted to the block, the roller having a frusto-conical roller surface, a smaller diameter roller end and a larger diameter roller end;
an impeller rotatably mounted to the block alongside the roller, the impeller having a frustoconical impeller surface, a smaller diameter impeller end and a larger diameter impeller end, the smaller diameter impeller end being in opposed relation to the larger diameter roller end;
the roller having a roller tangent line in the same plane as a rotational axis of the roller and on the roller surface;
the impeller having an impeller tangent line in the same plane as a rotational axis of the impeller and on the impeller surface;
a transfer wheel contacting the impeller tangent line and the roller tangent line;
control means for translating the wheel along the tangent lines;
a spindle;
a spindle axis along which the wheel translates;
spindle mounting means for mounting the spindle on the block, the spindle mounting means comprising
a smooth round end closely and slidably fit in the block so that the mounting means can rotate and translate relative to the block, the smooth round end oriented obliquely to a surface of the block facing the roller and impeller;
an outer portion defining an orifice accommodating the spindle;
locking means for releasably locking the spindle mounting means in an fixed position relative to the block.

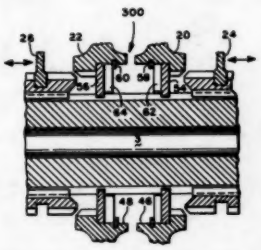
5,179,866

TRANSMISSION GEAR RETAINER

Joseph D. Reynolds, Climax, and Alan C. Stine, Kalamazoo, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 12, 1991, Ser. No. 790,973
Int. Cl.[5] F16H *3/08*
U.S. Cl. 74—332 5 Claims

1. In a transmission of the type having a mainshaft, at least one floating mainshaft gear encircling said mainshaft, at least two countershafts respectively disposed on opposite sides of the mainshaft in substantial parallel relationship thereto, said countershafts having respective countershaft gears supporting and rotatively driving the mainshaft gear therebetween, clutch means selectively operative to clutch the mainshaft gear to the mainshaft, and improved gear retaining means operative to limit axial movement of the mainshaft gear and to transmit axial thrust to the mainshaft imparted thereto when the mainshaft gear is clutched to the mainshaft by the clutch means, wherein said gear having an annular recess defined by a first surface that extends from a side thereof in substantially parallel facing relationship to the mainshaft and intersects a second substantially orthogonal surface that extends therefrom towards the mainshaft to the outer periphery of the gear,
a transverse annular groove in the mainshaft outer surface, said groove having an edge that faces in the same axial direction as the second surface and is in substantial axial alignment therewith,
a thrust washer having an inner periphery disposed in the mainshaft groove and secured to the mainshaft for rotation therewith, said thrust washer extending outwardly from the mainshaft groove into the recess in substantial



registration therewith and ending to provide a clearance from the first surface sufficient to enable the gear to rotate relative mainshaft and to prevent contact therebetween,
a slot disposed in the recess first surface an axial distance from the second surface sufficient to enable the thrust washer to fit therebetween, and
a removable retaining ring disposed in the slot and rotatable with the gear, said ring extending into the recess from the first surface for a distance sufficient to define a groove within the recess between the ring and the second surface into which the thrust washer is received that is substantially axially aligned with the mainshaft groove and operative to limit axial movement of the gear and to transmit axial thrust to the mainshaft imparted to the gear when clutched thereto by the clutch means, and
a spacer encircling the first surface between the thrust washer and the retaining ring, said spacer secured to the mainshaft gear and rotatable therewith without contacting the mainshaft.

5,179,867

AUTOMATIC TRANSMISSION FOR VEHICLE

Shiro Sakakibara; Takeshi Inuzuka; Masashi Hattori; Hironari Fukatsu, and Shinichi Takaki, all of Aichi, Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Dec. 17, 1990, Ser. No. 628,350
Claims priority, application Japan, Dec. 28, 1989, 1-338261; Dec. 28, 1989, 1-338262
Int. Cl.[5] F16H *59/04*
U.S. Cl. 74—335 6 Claims

1. An automatic transmission for a vehicle comprising:
(a) a plurality of friction engagement elements for establishing different driving ranges and gear ratios;
(b) a plurality of hydraulic operators for engaging and releasing said friction engagement elements;
(c) shift lever means including:
(i) a shift lever for manual selection by movement to any

of a plurality of shift positions, said shift positions corresponding to different ranges and gear ratios; and

(ii) restriction means for restricting the movement of the shift lever to a pattern including at least one H-shaped portion;

(d) selecting means for selecting the range and gear ratio which corresponds to the shift position to which the shift lever is moved;

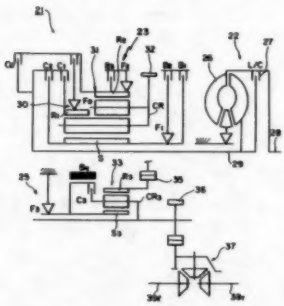
(e) a hydraulic fluid source;

(f) hydraulic control means including:

(i) a manual valve having a spool for switching hydraulic pressure responsive to said movement of said shift lever;

(ii) a plurality of solenoid valves turned on or off responsive to said selection of shift position by movement of said shift lever; and

(iii) a plurality of shift valves changed over, responsive to



the turning off or on of said solenoid valves, for selectively connecting said hydraulic fluid source to the hydraulic operators for the frictional engagement elements to establish a shift range and gear ratio; and

(g) electronic control means for (1) generating a signal indicative of the range or gear ratio selected by the shift lever to switch said solenoid valves, and (2) establishing, responsive to movement of the shift lever to a position intermediate two of said shift positions, either a mode A wherein the previous range and gear ratio are maintained, until said shift lever is positioned at a new shift position, or an automatic transmission drive mode B, during the time the shift lever is located in the intermediate position, said electronic control means including a switch for generating a driver intent signal, said mode A or mode B being selected by said electronic control means responsive to said driver intent signal.

5,179,868

DRIVE TRAIN ENABLE-DISABLE VEHICLE USE DEVICE

Roland Thibeault, 5923 West Maplewood Dr., Littleton, Colo. 80123

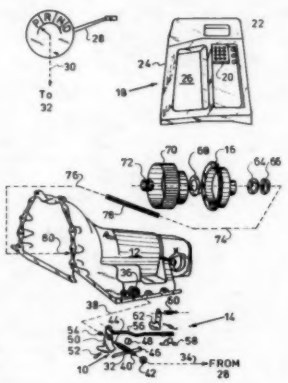
Filed Mar. 2, 1992, Ser. No. 844,785

Int. Cl.[5] F16H *57/10*

U.S. Cl. 74—411.5 **6 Claims**

1. In a motor vehicle automatic transmission of the type having a case and having an internal parking gear and the transmission having a parking shaft with a pair of ends, one end being positioned outside of the transmission and connected to a transmission selector lever in the motor vehicle and the other end positioned inside the transmission case and connected to an internal parking pawl operating mechanism, the improvement comprising:

(a) electro-mechanical disabling means, associated with the parking pawl operating mechanism and positioned inside the transmission case, to disable the parking pawl operating mechanism from being able to move the parking pawl once the pawl is locked on the transmission parking gear by the transmission selector lever and to retain the transmission in a parked position, wherein the disabling means comprises, in part, a notch formed in the existing transmission parking shaft and further comprises a solenoid and solenoid plunger, positioned in proximity to the notch in the existing transmission parking shaft to be operable to engage the notch with the solenoid plunger as desired to disable the movement of the parking shaft thereby preventing operation of the transmission selection lever to be able to move;



(b) enabling means, associated with the disabling means and located, in part, outside of the transmission case, to enable the parking pawl operating mechanism to operate as desired so as to be able to disengage the parking pawl from the transmission parking gear, thereby permitting the transmission to be operated as desired; and

(c) electrical means, associated with the electro-mechanical disabling means and the enabling means and positioned partly inside the transmission case and partly outside of the transmission case to activate the enabling means as desired.

5,179,869

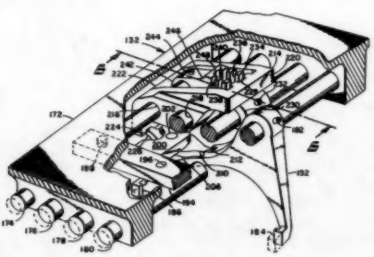
CHANGING SPEED IN A POWER TRANSMISSION

Joseph D. Reynolds, Climax, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 29, 1992, Ser. No. 827,779

Int. Cl.[5] B60K *20/00*; F16H *21/44*

U.S. Cl. 74—473 R **17 Claims**



1. A shifting mechanism for a multi-speed power transmission comprising:

(a) housing structure;

(b) a plurality of elongated shift rails mounted on said hous-

ing structure in an array in spaced parallel arrangement, said rails mounted on said housing structure for sliding movement in the direction of elongation between fore and aft gear changing positions;

(c) a first shift fork mounted on a first of said rails;

(d) a second shift fork mounted on a second of said rails;

(e) flipper means pivotally mounted on said housing structure on one side of said array, said flipper means having a first end thereof on one side of said pivotal mount engaging said second shift fork and operable upon pivoting for moving said second shift fork between said fore and aft positions;

(f) slider means mounted for sliding on a third of said rails, said slider means operably engaging a second end of said flipper means disposed on the opposite side of said pivotal mount from said first end; and,

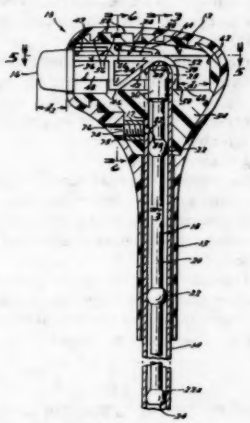
(g) shift stick means pivoted on said housing structure and operable upon user movement to selectively engage said first shift fork and said slider means for moving same between said fore and aft positions, said shift stick means disposed on the side of said array opposite said flipper means.

5,179,870

SHIFT CONTROL LEVER ASSEMBLY

William L. Behrens, Ortonville, and Arthur Anderson, Clarkston, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 16, 1991, Ser. No. 807,818
Int. Cl.[5] G05G 1/06; F16H 59/10
U.S. Cl. 74—475 **8 Claims**



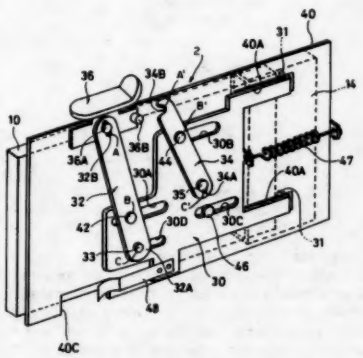
1. A transmission shift control lever assembly comprising a palm abutting knob and integrally molded hollow stem mounted on and around a fixed elongated cylindrical shift lever, a push rod slidably mounted in the fixed elongated cylindrical shift lever, an integral ball mounting means formed on the upper end of the push rod, a ball rotatably mounted in the integral ball mounting means, an operating button movably mounted in an end of the palm abutting knob, an actuating assembly operatively connected to the operating button and slidably mounted in the palm abutting knob, and a ramp segment formed as part of the actuating assembly adjacent the ball for urging the ball and its associated push rod downwardly upon manual depression of the operating button.

5,179,871

SYSTEM FOR UNLOADING A MEMORY CARTRIDGE

Masaaki Orimoto; Toshikatsu Harase, and Masahiko Mizuno, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 314,744, Feb. 24, 1989, abandoned. This application Jun. 19, 1991, Ser. No. 715,891
Claims priority, application Japan, Feb. 29, 1988, 63-047052
Int. Cl.[5] G05G 1/04; F16H 21/44; G11B 5/008
U.S. Cl. 74—516 **4 Claims**



1. An apparatus in combination with a memory cartridge and having a main body defining therein a path of travel of said memory cartridge in at least an insertion direction and a discharge direction, said apparatus further including a device for unloading said memory cartridge, said device for unloading said memory cartridge comprising:

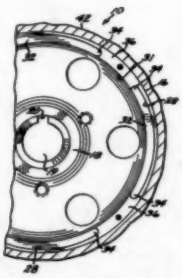
a cartridge engagement member arranged within said main body and movable in said insertion direction and discharge direction of said memory cartridge, said engagement member including an engagement portion operative to engage said memory cartridge at least when said cartridge engagement member is moved in said cartridge discharge direction;

a first lever rotatably disposed in said apparatus main body by means of a first fulcrum, said first lever comprising one end portion serving as a point of action for engaging with said cartridge engagement member and an other end portion serving as a point on which a force is applied, said first fulcrum being disposed at a position where a first leverage can be obtained;

a second lever rotatably disposed in said apparatus main body by means of a second fulcrum, said second lever comprising one end portion serving as a point of action for engaging with said cartridge engagement member and an other end portion serving as a point on which a force is applied, said second fulcrum being disposed at a position where a second lever can be obtained, said second leverage being less than said first leverage; and

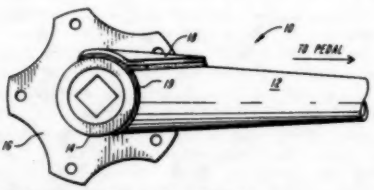
an eject member slidingly disposed in said apparatus main body and being freely movable in said cartridge insertion direction and discharge direction, said eject member being operative to engage with said other end portion of said first lever and said other end portion of said second lever, said eject member being operative to move said cartridge engagement member in the cartridge discharge direction through said first lever when it moves said cartridge engagement member initially within a predetermined range, and also to move said cartridge engagement member in the cartridge discharge direction through said second lever when it moves said cartridge engagement member beyond said predetermined range.

5,179,872
MAGNETO ROTOR
Robert J. Pernice, 708 S. Palomino La., Anaheim, Calif. 92807, assignor to Robert J. Pernice and Sophia C. Pernice, both of Anaheim, Calif., a part interest
Filed Oct. 11, 1991, Ser. No. 775,278
Int. Cl.[5] G05G 1/00; H02K 21/22
U.S. Cl. 74—572 21 Claims



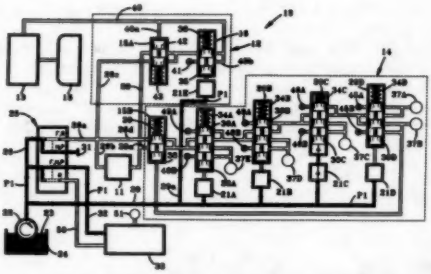
1. A magneto rotor, comprising:
a substantially bowl-shaped body with an open end defined by an annular rim having an inner peripheral surface;
a plurality of arcuate pockets in the rim, each of the pockets extending between first and seconds ends and having a radius of curvature substantially equal to the radius of curvature of the peripheral surface, each pocket having an open radially-inward side; and
a magnet formed as an arcuate plate of a neodymium-iron alloy disposed in each of the pockets, each magnet extending between first and second ends and substantially conforming to the shape of the pocket in which it is disposed, the magnets being retained in the pockets at least in part by the engagement between the pocket ends and the magnet ends, wherein the alloy comprises approximately 33 per cent neodymium, 64 per cent iron, 1 per cent boron, and 2 per cent dysprosium, and wherein the alloy, when magnetized, has a working temperature of approximately 120 degrees C.

5,179,873
BICYCLE CRANK ASSEMBLY
Robert H. Girvin, Holliston, Mass., assignor to Ocean State International, Inc., Woonsocket, R.I.
Filed Sep. 9, 1991, Ser. No. 756,540
Int. Cl.[5] G05G 1/14
U.S. Cl. 74—594.1 19 Claims



1. A bicycle crank assembly comprising:
a) a cylindrical hub;
b) a crank arm having a proximal end and a distal end attached to the hub at its proximal end at a connecting junction, a portion of the junction being subject to maximum tensile stress when the crank arm is driving the hub so as to propel a bicycle in a forward direction; and
c) a reinforcing member attached to both the crank arm and the hub, which member extends to a location on the crank arm more distal than the junction, and which member fully overlaps the junction at the portion subject to the maximum tensile stress.

5,179,874
HYDRAULIC CONTROL SYSTEM FOR VEHICULAR AUTOMATIC TRANSMISSIONS
Joseph H. Hunter, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 15, 1991, Ser. No. 775,396
Int. Cl.[5] B60K 41/22
U.S. Cl. 74—733.1 11 Claims



1. A hydraulic control system for an automatic vehicular transmission, said system adapted not only to control a plurality of torque transfer devices which effect sequential shifts between the various drive ratios supplied by the transmission but also to control the engagement and release of a torque converter clutch, said system comprising:
a transmission shift range subsystem having a plurality of solenoid operated relay valves which actuate torque transfer devices that control the shift between the drive ratios provided the transmission;
a torque converter clutch control subsystem having a solenoid operated relay valve which enables engagement and release of the torque converter clutch;
each said subsystem having a pressure control gate;
a source of hydraulic line pressure;
a modulating solenoid valve;
conduit means to provide line pressure to each said pressure control gate and said modulating solenoid;
further conduit means to provide modulated pressure from said modulating solenoid valve to each said pressure control gate; and,
said solenoid operated relay valves being operable to direct said modulated pressure through one or more of said relay valves to initiate shifting of said transmission and engagement of said torque converter clutch.

5,179,875
TURBINE SPEED CONTROLLER FOR AN AUTOMATIC TRANSMISSION
Larry T. Brown, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Mar. 22, 1991, Ser. No. 673,606
Int. Cl.[5] F16H 59/42, 61/02
U.S. Cl. 74—866 7 Claims

1. An automatic power transmission for delivering torque from an engine to a torque output member comprising a torque input member adapted to be driven by said engine;
a multiple ratio gear assembly having interacting gear elements, one of which is adapted to be connected drivably to said torque output member,
first clutch means for selectively connecting together two elements of said gear assembly, brake means for selec-

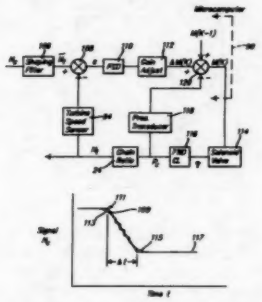
tively anchoring an element of said gear assembly to establish a torque reaction point;

second clutch means for connecting selectively said torque input member to a torque input element of said gear assembly, said second clutch means interrupting a torque delivery path between said engine and said torque output member when it is disengaged;

a hydraulic valve control including a pump and a solenoid operated valve means for controlling distribution of clutch actuating fluid from said pump to said second clutch means;

means for continuously monitoring the speed of said torque input member and for developing an electrical actual speed signal indicating the instantaneous speed of said torque input member;

an electronic processor means characterized by periodic control loops for sampling in each loop an error between said speed signal and a commanded speed signal value,



said processor including a memory for storing commanded speed signal values, said commanded speed signal being related to clutch engagement time with a pre-determined functional relationship that corresponds to a smooth clutch engagement for an engine and driveline, and a processor unit adapted to address said memory to obtain said commanded speed signal and to compare said commanded speed to said torque input member speed to obtain an adaptive error signal determinative of said error; and

means for developing an actuating electrical signal for said solenoid-operated valve means that is functionally related to said error signal whereby said second clutch means has smooth engagement characteristic with a controlled rate of engagement in a closed loop manner thus eliminating harshness caused by inertial effects as said transmission is conditioned for torque delivery, the engagement characteristic being repeatable in successive engagements regardless of changes in transmission variables.

5,179,876

DEVICE FOR ROTARY TORQUE ENHANCEMENT

Carlos E. Gadea Mantilla, Apartado 2442, Managua, Nicaragua

Filed Apr. 10, 1991, Ser. No. 678,658
Int. Cl.[5] B25B *17/00*
U.S. Cl. 81—57.3 **12 Claims**

1. A device adapted for increasing rotary torque, which device comprises:

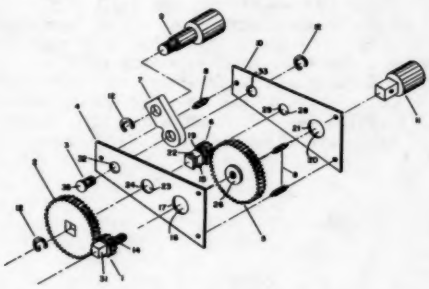
(a) at least two laterally disposed plates in spaced-apart substantially parallel planar alignment defining a space therebetween;

(b) gearing adapted to receive and amplify an input rotary torque, and to provide an amplified output rotary torque, at least a portion of said gearing being disposed within said space;

(c) means for applying input rotary torque to said gearing;

(d) means, including an output socket having an axis, for delivering amplified output rotary torque from said gearing to an object to be rotated;

(e) an arm having an inner end portion, said arm being pivotally supported at said inner end portion within said space at a locus such that a portion of said arm extends beyond the edge of said plates; and



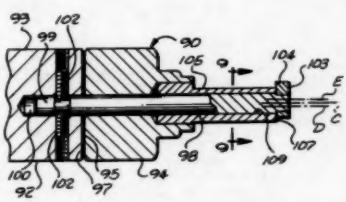
(f) a holding socket having an axis, for anchoring the device in one or more operating spatial positions during application of the input rotary torque, said holding socket being attached to said portion of said arm that extends beyond the edge of said plates such that the linear distance between the axis of said holding socket and the axis of said output socket is adjustable by rotation of said pivotally supported arm.

5,179,877

TAMPER-RESISTANT CABLE TERMINATOR SYSTEM

William J. Down, Phoenix, and Robert D. Hayward, Glendale, both of Ariz., assignors to Gilbert Engineering Company, Inc., Phoenix, Ariz.

Division of Ser. No. 402,815, Sep. 5, 1989, Pat. No. 5,055,060, which is a continuation-in-part of Ser. No. 360,777, Jun. 2, 1989, abandoned. This application Jun. 14, 1991, Ser. No. 715,791
Int. Cl.[5] B25B *23/00*
U.S. Cl. 81—443 **2 Claims**



1. A tool especially adapted for use in combination with a cable transmission system, said system including:

a cable terminal having an element of a rotationally engagable male/female connection pair, and

a tamper-resistant terminator having a complemental element of said connection pair and a bore coaxial with said connection pair,

and for installation and removal of said terminator with said terminal, and tool comprising:

a handle having a first portion and a second portion serially aligned;

said first portion having a tubular shaft extending therefrom;

said second portion having a first shaft extending axially through said first portion and through said tubular shaft,

and having a terminal end extending beyond a terminal end of said tubular shaft;

said tubular shaft extending coaxially with a first longitudinal axis;

said second portion and first shaft being rotatable about a second longitudinal axis which is substantially parallel to and spaced from said first longitudinal axis;

a disk eccentrically attached to said terminal end of said first shaft and rotatable therewith; and

said disk being concentric in relation to said terminal end of said tubular shaft in a first position and telescopingly moveable within the bore of said terminator;

said disk being eccentric in relation to said terminal end of said tubular shaft when said first portion and said second portion are rotated relative to each other for driving engagement with the bore of said terminator.

5,179,878

METHOD AND APPARATUS FOR SEVERING TIES AND WRAPPERS OF TEXTILE FIBER BALES

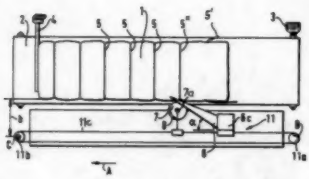
Andreas Kranefeld, Erkelenz; Josef Temburg, Jüchen, and Abi Marom, Mönchengladbach, all of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Aug. 15, 1991, Ser. No. 745,211

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1990, 4025890; Jun. 12, 1991, 4119336

Int. Cl.[5] B65B *69/00*

U.S. Cl. 83—13 **16 Claims**



1. A method of severing ties or a wrapper surrounding a fiber bale, comprising the following steps:

(a) displacing the fiber bale and a severing device relative to one another for feeding the ties sequentially to the severing device;

(b) slowly rotating a cutting wheel having a peripheral cutting edge and forming part of the severing device;

(c) introducing a counterelement, having a cutting edge forming part of the severing device, into the fiber bale and moving the counterelement relative to the fiber bale such that the counterelement penetrates underneath a tie to be severed and surrounding the fiber bale;

(d) causing the cutting wheel and the counterelement to assume an overlapping relationship;

(e) supporting the tie from below by said counterelement; and

(f) severing the tie by a cooperation between the cutting edge of the cutting wheel and the counterelement.

5,179,879

PROCESS FOR CONTROLLING THE PARALLELISM OF THE TWO BEAMS OF A PRESS USED FOR CUTTING SHEET OR WEBLIKE MATTER DESTINED TO BE CONVERTED INTO A PACKAGE

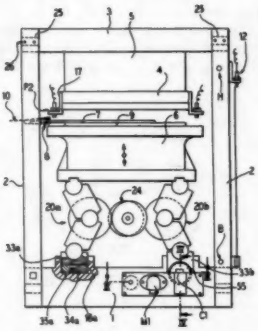
Marcel Yerly, Jouxtens, Switzerland, assignor to Bobst SA, Switzerland

Filed Apr. 25, 1991, Ser. No. 691,438

Claims priority, application Switzerland, Apr. 25, 1990, 01403/90

Int. Cl.[5] B26D *7/26*

U.S. Cl. 83—34 **13 Claims**



1. A method for regulating parallelism of two beams of a cutting press designed for converting sheet or weblike matter into a package, and wherein for each operating cycle, at least one beam is movable with respect to the other between a first position in which the two beams are separated from one another, and a second position in which they are in pressure contact, comprising the steps of:

in the course of an operating cycle of the press, measuring a deviation e from parallelism of the beams when they are in the second pressure position; and

in the first position with the beams separated, regulating parallelism of the beams in a direction enabling a correction of the measured deviation e from parallelism.

5,179,880

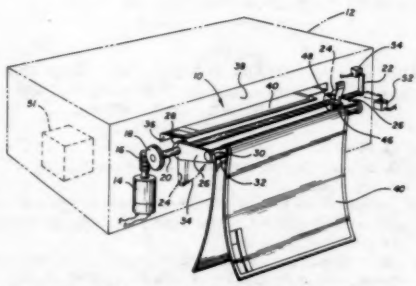
DEVICE FOR STACKING SHEETS OF PAPER

Michael T. Sherick, Thousand Oaks, Calif., assignor to Japan Digital Laboratory Co., Ltd., Japan

Filed Oct. 30, 1991, Ser. No. 785,279

Int. Cl.[5] B65H *31/00*

U.S. Cl. 83—83 **18 Claims**



1. A stacking device for stacking sheets of paper or material exiting, during successive cycles of operation, from a printer, plotter, copier, or other paper or material handling machine, comprising:

a stacking rod movably mounted at an output from said handling machine, said stacking rod being located below a path of said sheets out of said machine;

means for shifting the position of said stacking rod to upward and downward positions during each cycle of operation so that (1) said stacking rod comes into contact with one of said sheets exiting said machine when said stacking rod is in said upward position during said each cycle of operation causing said one sheet to drape over said stacking rod, so that (2) said sheet hangs vertically and downwardly draped over said stacking rod when said stacking rod is in said downward position during said each cycle of operation, and so that (3) a plurality of said sheets are stacked on top of said stacking rod and on top of each other during successive cycles of operation, said means for shifting the position of said stacking rod including:

(a) a drive shaft rotatably mounted on said machine,

(b) at least one arm, each of said arms having one end thereof attached to said drive shaft and the other end thereof attached to said stacking rod, and

(c) a motor mounted on said machine and engaged to said drive shaft; and

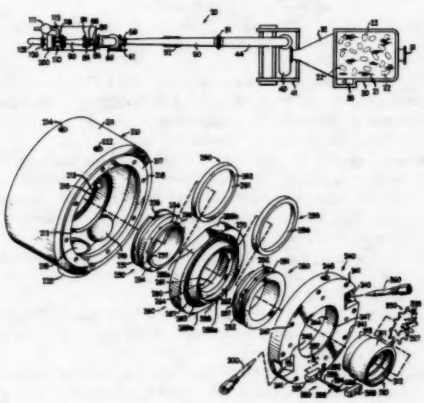
means for controlling upward and downward rotation of said stacking rod and for controlling rotation of said drive shaft.

5,179,881

SYSTEM FOR PRODUCING HELICAL VEGETABLE STRIPS AND TURBINE THEREFOR

Max Frey, Portland; Richard S. Livermore, Oregon City, and John M. Bowie, Salem, all of Oreg., assignors to McCain Foods Limited, Florenceville, Canada

Filed Apr. 23, 1991, Ser. No. 690,818
Int. Cl.[5] B26D *3/11*
U.S. Cl. 83—98 **51 Claims**



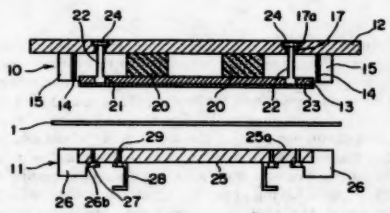
51. A hydraulic system for cutting vegetables into generally helically shaped strips comprising input means for receiving a liquid carrier and the vegetables, a conduit for the liquid carrier and the vegetables, said conduit having an inlet and an outlet, pump means coupled between said input means and said inlet for transporting the liquid carrier and the vegetables through said conduit, a turbine coupled to said outlet and including a rotor and a multiplicity of vanes thereon and at least one nozzle aimed at said vanes, said nozzle being adapted to generate a jet of liquid to cause rotation of said rotor, a cutter coupled to said rotor and being rotated thereby, said cutter including means for slicing the vegetables into helical strips, said turbine further including at least one stator carrying said rotor and spaced therefrom, and means for applying into the space between said stator and said rotor water as the sole lubrication therefor.

5,179,882

WASTE REMOVING APPARATUS

Takayuki Takeuchi, Takarazuka, and Isao Hirata, Settsu, both of Japan, assignors to Nippon Die Steel Co., Ltd. and Asahi Machinery Ltd., Osaka, Japan

Filed Feb. 20, 1990, Ser. No. 481,562
Claims priority, application Japan, Feb. 20, 1989, 1-042315
Int. Cl.[5] B26D *7/18*
U.S. Cl. 83—125 **6 Claims**



1. A waste removing apparatus for removing waste portions from a production region of a sheet of paper along punch lines on the sheet of paper, comprising:

a first cutting die for engaging the sheet of paper for removal of waste portions from the product region thereof therefrom, said first cutting die having a first holding plate for holding the product region of the sheet of paper, said first holding plate having a predetermined configuration corresponding to the shape of the product of the region;

a second cutting die for engaging the sheet of paper together with said first cutting die to remove the waste portions from the product region of the sheet of paper, said second cutting die comprising a second holding plate for holding the product region of the sheet of paper, whereby said first and second holding plates hold the sheet of paper therebetween when the waste portions are removed, said second holding plate having a predetermined configuration corresponding in to the shape of the desired product region and corresponding to the configuration of said first holding plate; and

cutting means on said second cutting die for removing the waste portions of the sheet of paper not within the area of the sheet of paper held by said first and second holding plates when said first and second cutting dies hold the sheet of paper therebetween with said first and second holding plates;

wherein both said first and second holding plates have flat planar surfaces for uniformly applying pressure to the product region of the sheet of paper for holding the sheet of paper securely therebetween;

wherein said second holding plate is movably mounted on said second cutting die and has biasing means for resiliently biasing said second holding plate toward said first holding plate when said first and second holding plates are engaged;

wherein said second cutting die has a base plate, said second holding plate is movably connected to said base plate, and said biasing means comprises elastic members disposed between said second holding plate and said base plate; and

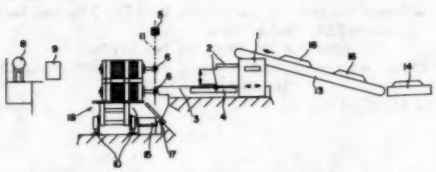
wherein said cutting means comprises a plurality of blades extending about the periphery of said second holding plate and having substantially the same configuration as said first and second holding plates, said blades being spaced from each other at predetermined intervals.

5,179,883

APPARATUS FOR DIVIDING WOOD

Hans Payr, Graben 1, A-9560 Feldkirchen-Poitschach, Austria

Filed Jul. 29, 1991, Ser. No. 737,810
Claims priority, application Austria, Jul. 30, 1990, 1596/90
Int. Cl.[5] B26D *7/06;* **B27B** *5/06, 5/18*
U.S. Cl. 83—155.1 **14 Claims**



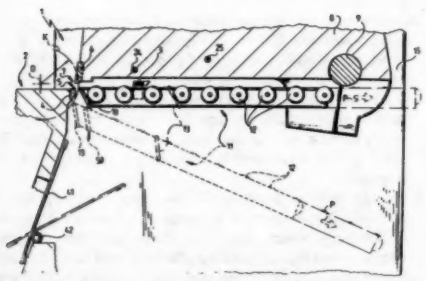
1. Apparatus for dividing elongate wood comprising: a device for holding the wood, a saw unit displaceable in parallel to the longitudinal extension of the wood for executing the dividing work, and means for feeding the wood to be divided in a direction transverse to the direction of motion of the saw unit; said device for holding the wood being adjustable transverse to the direction of movement of the saw unit in order to set the cutting position, and including clamping trestles, each clamping trestle having upper and lower clamping jaws engaging the wood from above and from below, slideways from the clamping trestles and supports for the wood, said supports having cutouts for lowering the lower clamping jaws supported at the clamping trestles through said cutouts below the supports; said saw unit being guided on a stationary guide means and being effective toward two sides; said means for feeding the wood comprising a longitudinal conveyor and at least two transverse conveyors extending from the longitudinal conveyor obliquely over the clamping trestles, and lifting tables arranged beside each support, said tables being raisable from a ready position wherein they are lowered beneath the supports into a transfer position, wherein they are arranged beside the ends of the transverse conveyors on a delivery side.

5,179,884

PLATE SHEARS

Wolfgang Kutschker, Böblingen, and Erwin Pesold, Sindelfingen, both of Fed. Rep. of Germany, assignors to Reinhardt Maschinenbau GmbH, Sindelfingen, Fed. Rep. of Germany

PCT No. PCT/EP90/00521, § 371 Date Nov. 19, 1991, § 102(e) Date Nov. 19, 1991, PCT Pub. No. WO90/14190, PCT Pub. Date Nov. 29, 1990
PCT Filed Apr. 3, 1990, Ser. No. 773,585
Int. Cl.[5] B23D *33/02;* **B26D** *7/18*
U.S. Cl. 83—156 **7 Claims**



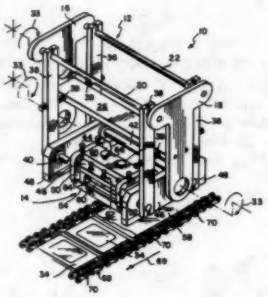
1. Plate shears for plate-shaped workpieces, in particular metal plates, comprising a stationary lower blade, an upper blade secured to a vertically movable blade beam, a cutting bench arranged in front of these blades, a tilting roller table arranged behind the blades and having several parallel rows of rollers, said tilting roller table serving to transport cut-off workpiece parts away, the table is tiltable downwardly about an axis of rotation essentially parallel to the cutting edges of said blades while also movable back and forth relative to said blades essentially perpendicular to said axis of rotation, and an adjustable stop arranged behind said blades for workpieces to be cut to a given width, characterized in that tilting of said tilting roller table **(11)** downwards about said axis of rotation (D) simultaneously brings about lowering of a front edge **(13)** of said tilting roller table **(11)** located close to said lower blade **(4)**, said axis of rotation (D) of said tilting roller table **(11)** being located in front of said blades **(4, 6)** in the region of said cutting bench **(2)**.

5,179,885

FLYING SHEARS WITH WORKPIECE ALIGNMENT DEVICE

Jesse C. McLeod, Louisville, Ky., assignor to Raque Food Systems, Inc., Louisville, Ky.

Filed Jan. 25, 1991, Ser. No. 646,059
Int. Cl.[5] B26D *1/56*
U.S. Cl. 83—315 **25 Claims**



22. An assembly for processing a material which is continuously conveyed in a predetermined direction and at a predetermined speed, the assembly comprising

a support assembly,

means coupled to the support assembly for moving the support assembly in a predetermined path so that the support assembly passes above the material at substantially the predetermined speed and direction during a first portion of the path,

a tool for working on the material as the support assembly moves above the material during the first portion of the path,

means for pivotably coupling the tool to the support assembly to permit limited movement of the tool relative to the support assembly, and

means for aligning the tool with respect to the material as the support assembly moves over the material.

5,179,886

RADIAL BEAM ARM SAW TABLE

Marvin E. Rathje, Jr., 1749 Navajo Rd., El Cajon, Calif. 92020

Filed May 15, 1991, Ser. No. 700,444
Int. Cl.[5] B27B *5/20*
U.S. Cl. 83—471.3 **9 Claims**

1. A radial beam arm saw table comprising:

a portable stand with four upright legs, each of said legs having a top end and a bottom end, a plurality of horizontal cross members connect the respective top ends of said legs together to form a rigid four sided support frame;

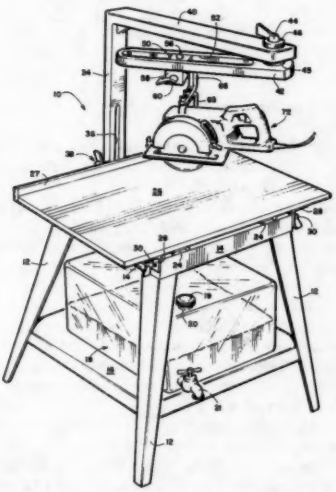
said portable stand having a front end and a rear end;

a work platform mounted on the top of said portable stand;

a vertical post member having a top end and a bottom end, a support arm having a longitudinal axis, said support arm having a front end and a rear end, said rear end being rigidly connected to the top end of said vertical post member and said front end extends horizontally out over said work platform;

means for adjustably supporting the bottom end of said vertical post member so that it can be adjusted vertically with respect to said work platform;

an elongated radial beam having a longitudinal axis, said radial beam having first and second ends, said first end being pivotally connected to the front end of said (radial) support arm about a vertical axis so that said radial beam may be pivoted beneath said (radial) support arm to a retracted position with their respective longitudinal axes being parallel aligned one above the other, said radial beam may also be pivoted 180 degrees to an extended position with their respective longitudinal axes being parallel aligned one above the other and the second end of said radial arm is located at its most remote distance from said vertical post member;



a carriage and means for mounting it to said radial beam so that it may travel axially back and forth along the length of said radial beam;

a carriage platform and means for pivotally connecting it to said carriage about a vertical axis so that it may be rotated 360 degrees;

a bevel platform and means for pivotally connecting it to said carriage platform about a first horizontal axis that is perpendicular to the longitudinal axis of said elongated radial beam so that a saw blade can be raised vertically to perform chop cuts;

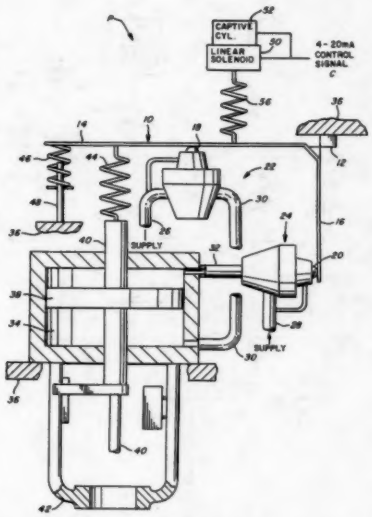
a handle adaptor and means for pivotally connecting it to said bevel platform about a second horizontal axis that is perpendicular to said first horizontal axis so that bevel cuts can be performed, said handle adaptor having an elongated leg portion and means for detachably securing the handle of a conventional circular saw thereto, said second horizontal axis being laterally offset from the longitudinal axis of said radial beam and also parallel to the longitudinal axis of said radial beam and said elongated leg portion extends perpendicular to and underneath said radial beam.

5,179,887

CAPTIVE CYLINDER LINEAR SOLENOID VALVE POSITIONER

Chris M. Leinen, Houston, and Robert E. Schendel, Kingwood, both of Tex., assignors to Topworks, Inc., Houston, Tex.

Filed Apr. 2, 1991, Ser. No. 679,296
Int. Cl.[5] F15B *13/16*
U.S. Cl. 91—387 **31 Claims**



1. A control element positioning apparatus, comprising:

a balance beam, said balance beam being coupled to a pivot element;

a pair of pneumatic force balance elements each having an air nozzle, the nozzle of each force balance element being disposed adjacent to said balance beam and positioned whereby movement of said balance beam towards one nozzle moves said balance beam away from the other nozzle, each of said force balance elements having a pneumatic output element;

a cylinder, said cylinder having a piston disposed therein, said piston being coupled to a shaft;

each of said pneumatic output elements being coupled to an end of said cylinder;

a range spring coupled between said shaft and said balance beam;

a control spring having two ends, the first end coupled to said balance beam;

means having a shaft and electrical signal inputs for varying the position of said shaft in proportion to a signal received at said electrical signal inputs, said shaft being coupled to the second end of said control spring and extending from said position varying means;

a closed cylinder having an aperture for receiving said shaft extending from said position varying means, a piston connected to said shaft dividing said cylinder in first and second chambers, a fluid contained in said cylinder and a port in each of said first and second chambers; and

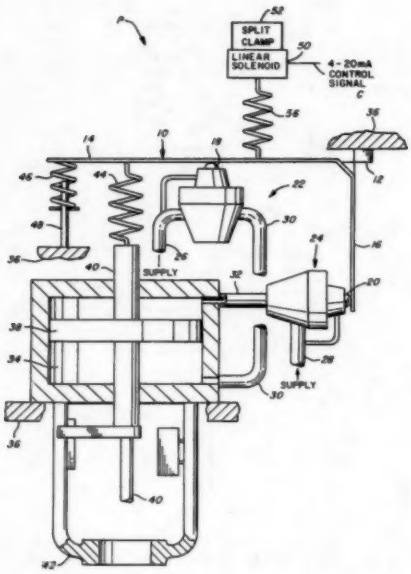
an electrically operated valve connected to said ports of said first and second captive cylinder chambers and having electrical signal inputs for receiving an electrical control signal said valve being activated to allow transfer through said ports of said first and second chambers and blocking fluid transfer through said ports when deactivated.

5,179,888

SPLIT CLAMP LINEAR SOLENOID VALVE POSITIONER

Robert E. Schendel, Kingwood, and Chris M. Leinen, Houston, both of Tex., assignors to Topworks, Inc., Houston, Tex.

Filed Apr. 2, 1991, Ser. No. 679,566
Int. Cl.[5] F15B *13/16*
U.S. Cl. 91—387 47 Claims



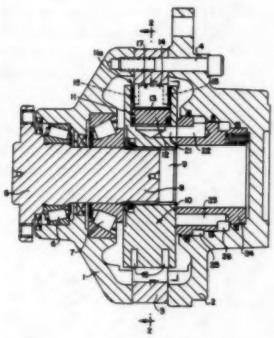
1. A control element positioning apparatus, comprising:
a balance beam, said balance beam being coupled to a pivot element;
a pair of pneumatic force balance elements each having an air nozzle, the nozzle of each force balance element being disposed adjacent to said balance beam and positioned whereby movement of said balance beam towards one nozzle moves said balance beam away from the other nozzle, each of said force balance elements having a pneumatic output element;
a cylinder, said cylinder having a piston disposed therein, said piston being coupled to a shaft;
each of said pneumatic output elements being coupled to an end of said cylinder;
a range spring coupled between said shaft and said balance beam;
a control spring having two ends, the first end coupled to said balance beam;
means having a shaft and electrical signal inputs for varying the position of said shaft in proportion to a signal received at said electrical signal inputs, said shaft being coupled to the second end of said control spring; and
clamp means having at least two elements surrounding said shaft, each element having a magnetic portion, and having means for producing firm contact of said elements and said shaft when electrical signals below a predetermined magnitude are provided to said position varying means and wherein said elements are removed from firm contact with said shaft when electrical signals above said predetermined magnitude are provided to said position varying means, freeing said shaft for movement.

5,179,889

RADIAL PISTON ENGINE

Peter Wüsthof, Lohr, Fed. Rep. of Germany, and Sinclair Cunningham, Fife, Scotland, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Feb. 15, 1991, Ser. No. 656,191
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1990, 4004932
Int. Cl.[5] F01B *1/06*
U.S. Cl. 91—491 10 Claims



1. A radial piston engine comprising:
a housing;
an annular cam disk (3) fixedly mounted in said housing;
a cylinder block (100) rotatably mounted about an axis with respect to said cam disk (3);
a plurality of bores (110) extending in said cylinder block radially with respect to said rotational axis;
a plurality of pistons (120) respectively reciprocally mounted within said bores 9110);
cylindrical rollers (14) for supporting said pistons (120) on said cam disk (3), said rollers having two oppositely located end surfaces and axes which extend parallel to the rotational axis of said cylinder block, and
first recesses (108,109) machined in said cylinder block, in the absence of forming circumferential grooves in the area of movement of said rollers so as to define a generally rectangular bore adapted to receive roller sections at both end surfaces of the rollers,
guide surfaces (103,104) for each roller oppositely and laterally arranged in said cylinder block for guiding said roller end surfaces, wherein
the radially extending depth of the guide surfaces (103,104) ends above the piston ring (123) when the piston (120) has reached its upper dead center.

5,179,890

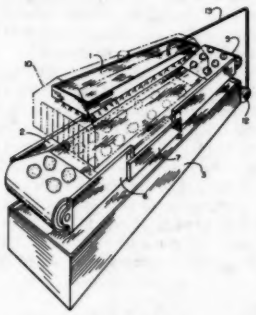
PASTEURIZING MACHINE

Zohar Reuveni, Moshav Beit Herut, and Itzhak Eshtein, 18 Mivtza Kadesh Street, Rishon Lezion, both of Israel

Filed Jan. 15, 1991, Ser. No. 641,743
Claims priority, application Israel, Jan. 18, 1990, 93099
Int. Cl.[5] A23L *3/00*
U.S. Cl. 99—362 4 Claims

1. A pasteurizing machine comprising lowermost, uppermost and intermediate water containers placed superposed to one another, the water being heated in the lowermost container and being pumped to the uppermost container, the uppermost container having a bottom surface provided with apertures to permit the water to drip into the intermediate

container in which a conveyor belt travels, and means being provided for adjusting the level of the water relative to the



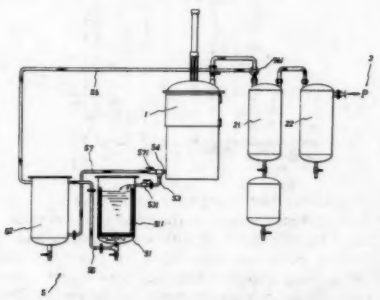
level of the conveyor belt traveling through the intermediate container.

5,179,891

OIL SUPPLYING AND RECYCLING EQUIPMENT FOR A VACUUMIZED FRYING APPARATUS

Yao-Jui Chiu, Chiayi Hsien, Taiwan, assignor to Great Health, Enrich Life China Tasty Food Co., Ltd., Chiayi Hsien, Taiwan

Filed Jul. 10, 1992, Ser. No. 911,709
Int. Cl.[5] A47J *37/12*
U.S. Cl. 99—408 1 Claim



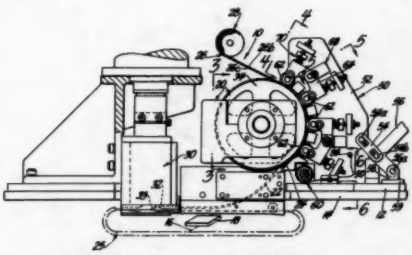
1. An oil supplying and recycling device for a vacuumized frying apparatus, comprising a frying pan, a first and second auxiliary vacuum tanks, a vacuum pump and an oil supplying and recycling equipment wherein said oil supplying and recycling equipment includes a filtering tank and a hollow reservoir tank; said filtering tank is provided with a U-shaped filter which is disposed along the vertical wall and the bottom thereof and is made of non-woven fabrics; said filtering tank is connected to a valve controlled recycling duct in connection to a main duct at the top end and to a connecting duct at the bottom end thereof; said reservoir tank is provided with a valve controlled vacuum duct in connection to said first and second vacuum tank and said vacuum pump and to said connecting duct at the top end thereof and is provided with a valve controlled discharge duct in connection to said main duct at the bottom end thereof; whereby the frying oil used in said frying pan can be recycled and filtered by use of said vacuum pump and said first and second auxiliary vacuum tanks.

5,179,892

STRAP FEED ASSEMBLY WITH FLOATING BACK-UP WHEELS

Samuel Cicatello, East Amherst, and Robert M. Macartney, Lockport, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 18, 1991, Ser. No. 670,625
Int. Cl.[5] B65B *13/22*
U.S. Cl. 100—32 3 Claims



1. A strap feed assembly for wrapping a flexible strap around an item including a drive wheel connected to a reversible drive motor for feeding and reversing the strap to wrap the strap around an item and to tension the strap once it is wrapped around the item, the improvement comprising:

said drive wheel having a peripheral surface including a knurled surface for defining a contact surface between the strap and the drive wheel during feeding and wrapping of the strap around the item;

force generating means operatively connected to said drive wheel to provide a drive force on said strap of a magnitude sufficient to both feed and tension the strap during reversal of the drive motor between a feed mode and a tension mode of operation;

said force generating means including means for attenuating the force imposed on the strap during the tension mode thereby to reduce pressure on the strap for preventing strap deformation so as to maintain consistent feed of the strap around the item to be wrapped; and

a plurality of back-up wheels spread through more than 90 degrees of said drive wheel, each of said back-up wheels including a surface portion with knurling formed completely circumferentially therearound having a width substantially corresponding to the width of the knurling on said drive wheel,

said means for attenuating including a separate biasing means connected to each of said plurality of back-up wheels for independently biasing said back-up wheels radially against said drive wheel.

5,179,893

CAN CRUSHING AND STORAGE UNIT

Larry V. Richardson, Riverside, Calif., assignor to Kantech Industries, Inc., Irvine, Calif.

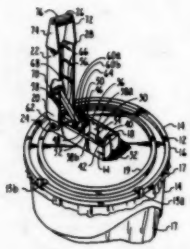
Continuation-in-part of Ser. No. 650,661, Feb. 5, 1991. This application Sep. 16, 1991, Ser. No. 760,618
Int. Cl.[5] B30B *9/32, 1/02*
U.S. Cl. 100—98 R 5 Claims

1. A can crushing and storage unit, comprising:

a can crusher, including a housing having an open side and forming a channel for receiving the can therein, said housing having a first end and a second end, said housing defining an opening formed near said second end, said channel defining a space sized and shaped to receive a standard sized aluminum can having a longitudinal axis so that said longitudinal axis of said can is substantially horizontal and perpendicular to said ends of said housing, said can crusher further comprising a plate reciprocally disposed within said channel for urging said can against said

second end of said housing and a rod pivotally connected to said plate and an elongated lever arm having a pair of ends, said lever arm pivotally connected to said rod between said pair of ends of said lever arm, said lever arm also being pivotally connected to said housing for moving said plate toward said second end of said housing to compress said can;

a lid upon which said can crusher is mounted, said lid having



a passage therethrough juxtaposed with said opening in said housing; and

a receptacle to which said lid is secured, wherein said crusher crushes a can positioned within said space until it is sufficiently axially compacted that gravity causes it to fall through said opening in said housing and through said passage in said lid and into the receptacle, wherein said opening and said passage are generally vertically aligned with the center of gravity of said unit.

5,179,894

CALENDER WITH POSITIONABLE ROLLERS

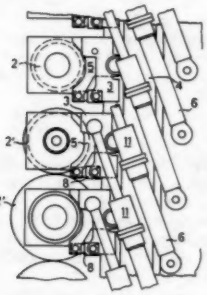
Joachim Hinz, Tettnang; Josef Schneid, Vogt; Andreas Steidele, Ravensburg-Schmalegg; Karl Volz, Baindt, and Wolf-Gunter Stotz, Ravensburg, all of Fed. Rep. of Germany, assignors to Sulzer Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Oct. 26, 1990, Ser. No. 603,633

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1989, 3936048

Int. Cl.[5] B30B *3/04*

U.S. Cl. 100—163 A **20 Claims**



1. Calender comprising:

a support (4);

an uppermost roller;

a lowermost roller;

intermediate rollers disposed between said uppermost roller and said lowermost roller;

means (7) for achieving a raising or lowering displacement of said lowermost roller;

respective bearings for said intermediate rollers, said bearings being supported on sliding members (3) and said sliding members being vertically movable with respect to said support (4);

a plurality of levers (5), each of said levers having a first end and a second end, said first end pivotally connected to a respective one of said sliding members about a respective pivot axis and said second end connected to an associated end of one of said intermediate rollers; and

fixation devices (6) for fixing said sliding members relative to said support, wherein each of said fixation devices (6) is formed as a respective piston and cylinder unit comprising a piston and a cylinder, said unit having a first end secured to said support (4) and a second end secured to the respective sliding member (3), wherein a pressurized fluid supply is provided for said piston and cylinder units, there being means for controlling the admission of pressurized fluid to and the discharge of pressurized fluid from said piston and cylinder units and for selectively blocking the displacement of the piston within the cylinder of said unit.

5,179,895

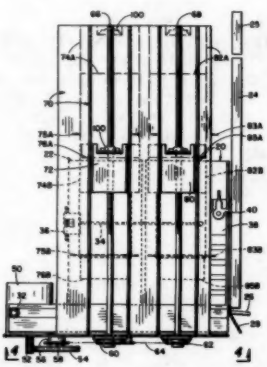
TRASH COMPACTOR

John R. Bauer, 6741 S. Birmingham, Tulsa, Okla. 74136

Filed May 1, 1991, Ser. No. 694,383

Int. Cl.[5] B30B *1/18*

U.S. Cl. 100—193 **1 Claim**



1. A residential trash compactor comprising:

a housing defining a front portion and a rear portion;

a drawer slidable disposed within said housing and having tandemly positioned therein a front individual trash receiving compartment within said drawer and a rear individual trash receiving compartment within said drawer;

a first compacting ram configured to fit and vertically move within said front individual trash receiving compartment;

a second compacting ram configured to fit and vertically move within said rear individual trash receiving compartment;

a first pair of drive screws threadably engaged within said front compacting ram and having an upper end and a lower end;

a second pair of drive screws threadably engaged within said rear compacting ram and having an upper end and a lower end;

a first group of four sprockets attached to the lower ends of each of said first and second pairs of drive screws;

a single endless drive chain configured to movably engage each of said sprockets;

a second group of two sprockets placed centrally to said first group of four sprockets and engaging said drive chain so as to cause increased meshing of said drive chain with said first group of sprockets;

a third sprocket adjustably mounted toward the front of the

drawer and engaging said drive chain so as to allow the tension on said chain to be varied; and

a motor having means to engage the drive chain to rotate said drive screws.

5,179,896

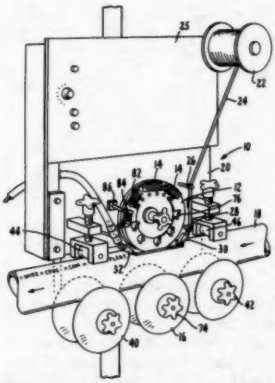
INDENT PRINTER FOR PLASTIC PIPE AND METHOD OF USE

James R. Copeland, Melrose Park, Ill., assignor to Chevron Research & Technology Company, San Francisco, Calif.

Filed Oct. 18, 1991, Ser. No. 779,047

Int. Cl.[5] B41F *17/10*

U.S. Cl. 101—6 **13 Claims**



1. An indent printer comprising:

a marking wheel having a plurality of printing heads operatively connected to the periphery thereof, at least one of said printing heads being adjustable to change printing type inidicia; and

at least one support roller spaced from said marking wheel, the circumference of said support roller being complimentary to said marking wheel to support therebetween a moving substrate of plastic pipe to be marked, said marking wheel being rotatably connected to a movable mount means for movement toward and away from said support roller, said movable mount means being vertically adjustable relative to said support roller, said movable mount means including means to heat said marking wheel to maintain uniform elevated temperature of said printing heads to affect printing, said mount means further including at least one guide means adjustably connected to said mount means to contact and ride on the surface of a plastic pipe to be marked to floatably support the weight of said mount means and said marking wheel upon such a surface to control the vertical spacing of said printing heads relative to such a surface.

5,179,897

PATTERN REPEAT PRESETTING OF A MULTI-COLOR ROTARY SCREEN PRINTING MACHINE

Paulus M. M. Liebregts, Veldhoven, Netherlands, assignor to Stork Brabant B.V., An Boxmeer, Netherlands

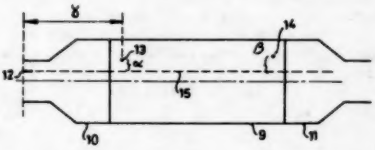
Filed Oct. 15, 1990, Ser. No. 597,312

Claims priority, application Netherlands, Oct. 20, 1989, 8902600

Int. Cl.[5] B41M *1/12*

U.S. Cl. 101—129 **5 Claims**

1. A method for the pattern repeat presetting of a multi-printing position rotary screen printing machine for multi-colour printing, comprising the steps of: (a) providing patterned cylindrical stencils, each of said stencils comprising one or more stencil reference points related to the pattern; (b) providing an end ring at each end of each of said stencils, at least one of said end rings comprising an end ring reference point; (c) placing said stencils in the printing positions of the rotary



screen printing machine; and (d) independently determining stencil data and printing position data, such that for each printing position a fixed relation between the stencil data and the printing position data is set.

5,179,898

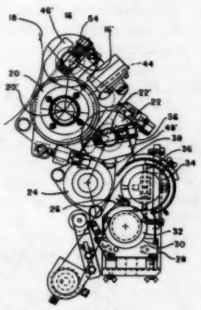
PRINTER WITH ROLLER MOUNTING ASSEMBLY

Gary Sun, Naperville, Ill., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 15, 1991, Ser. No. 792,982

Int. Cl.[5] B41L *23/00*

U.S. Cl. 101—148 **19 Claims**



1. In a printing press having a plate cylinder for receipt of liquid from a liquid source via a form roller in contact with the plate cylinder and an elongate drum roller in contact with the form roller for carrying the liquid thereto, the improvement being a roller mounting assembly for mounting rollers to uniformly convey liquid from the source to the elongate drum roller, comprising:

a transfer roller in contact with the elongate drum roller and located intermediate the source and the elongate drum roller for carrying liquid to the drum roller; and

means for mounting the transfer roller to oscillate along the length of the drum, in which said form roller is elongate and oscillates in its elongate direction, and said roller mounting assembly includes means for mounting the form roller to oscillate in the same direction of oscillation as that of the transfer roller.

5,179,899

TOWER PRINTING SYSTEM HAVING MULTIPLE VERTICALLY STACKED SATELLITE PRINTING STATIONS

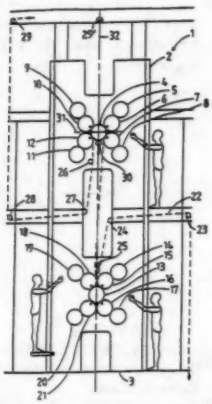
Ranier Burger, and Georg Riescher, both of Augsburg, Fed. Rep. of Germany, assignors to Man Roland Druckmaschinen AG, Offenbach-am-Main, Fed. Rep. of Germany

Filed Oct. 9, 1990, Ser. No. 595,358

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1989, 3939432

Int. Cl.[5] B41F *5/18*

U.S. Cl. 101—181 6 Claims



1. Tower printing system (1) for printing on a substrate web (2) having at least two vertically stacked satellite printing stations (2, 3),

each of said satellite printing stations including

a common impression cylinder (4, 13), whereby one impression cylinder will form a lower impression cylinder and another impression cylinder (4) will form an upper impression cylinder, and

at least four printing couples (5, 6; 8, 7; 9, 10; 11, 12; 14, 15; 17, 16; 19, 18; 20, 21), each of said printing couples having a blanket cylinder and a plate cylinder, two each of said printing couples being operatively associated with a respective one of the common impression cylinders, the blanket cylinders being engageable against the respective impression cylinder, and being selectively engageable against each other,

and wherein, in accordance with the invention,

in at least one of said satellite printing stations, two blanket cylinder of said at least two printing couples (8, 7; 11, 12) form vertically associated blanket cylinder pairs (6, 7; 10, 12) in which the blanket cylinders of the pairs are selectively engageable against each other, and positioned such that a tangent of the engagement line or nip of said two vertically positioned blanket cylinders of the pairs is in an at least approximately horizontal plane (31);

the blanket cylinders (6, 7; 10, 12) of the pairs are horizontally spaced from each other with respect to a vertical center line (32) passing through the respective common impression cylinder (4) to define a clearance space or gap therebetween;

an image maintenance device (30) is provided, located in the clearance space, said image maintenance device being operatively associated with the respective common impression cylinder (4); and

web guide means (23, 24, 25, 26, 27, 28, 29) are provided for guiding the web (22) about the lower (13) impression cylinder, then upwardly about the upper (4) impression cylinder.

5,179,900

CONTROLLABLE GRIPPER ASSEMBLY

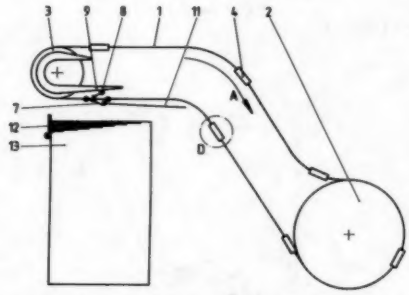
Volkmar R. Schwitzky, Oberduerrbach, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wirzburg, Fed. Rep. of Germany

Filed Jun. 10, 1992, Ser. No. 896,665

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1991, 4119118

Int. Cl.[5] B41F *21/04;* B65H *29/28, 29/04*

U.S. Cl. 101—240 6 Claims



1. A controllable gripper assembly for delivery of sheets in a printing press to a sheet stack, said controllable gripper assembly comprising:

first and second spaced, generally parallel transport chains which follow a path around chain wheel drive and chain reversing wheels;

a plurality of controllable gripper units secured to said first and second transport chains, each of said controllable gripper units having spaced first and second plates attached to said first and second transport chains;

a gripper carriage secured between each said first and second plates and slidable on said plates in, and opposite to, the direction of movement of said first and second transport chains;

releasable sheet gripping means on said gripper carriage; and

means to slide said gripper carriage with respect to said first and second plates in a direction opposite to said direction of movement of said transport chains to reduce the speed of movement of said gripper carriage in said direction of said transport chains with respect to said transport chains.

5,179,901

SUBTERRANEAN STORAGE VAULT

Gerald L. Adcock, 2033 3rd Ave. North, Lewiston, Id. 83501

Filed Aug. 29, 1991, Ser. No. 752,283

Int. Cl.[5] E05G *1/00*

U.S. Cl. 109—45 13 Claims

1. A subterranean storage vault, comprising:

a rigid vault casement having a wall extending between a closed bottom end and an open top end, said wall being formed to fit within a subterranean drilled bore;

a lid engagable with the open top end to selectively close the open top end;

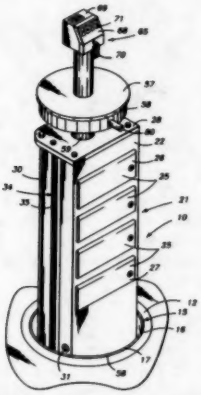
a carriage within the vault casement with a receptacle thereon adapted to receive and support an article to be stored;

a first guide between the vault casement and carriage, engaging the carriage to guide movement thereof between a storage position within the vault casement, and an access position outside the vault casement;

a driver comprised of an extensible cylinder mounted within the vault extending alongside the carriage between the carriage and vault casement wall, said cylinder including a piston mounted to the carriage and a cylinder body mounted to the vault casement and selectively operable to

move the carriage between the storage and access positions;

a second guide slidably mounted to the cylinder body and attached to the carriage to guide the carriage between the storage position within the vault casement, and the access position outside the vault casement and



a control system connected to the driver and a user control device outside the vault casement enabling user operation of the driver to move the carriage between the storage and access positions.

5,179,902

METHOD AND APPARATUS FOR MELTING MATERIALS CONTAINING INORGANIC MATERIAL FIBERS BY THE SUPPLY OF OXYGEN RICH GAS

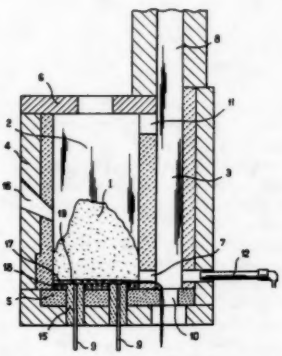
Strnad Vojtech, Helsingborg, Sweden, assignor to Isover Saint-Gobain, Courbevoie, France

Division of Ser. No. 730,455, Jul. 16, 1991, which is a continuation of Ser. No. 480,827, Feb. 16, 1990, Pat. No. 5,063,860. This application May 7, 1992, Ser. No. 879,307

Claims priority, application Sweden, Feb. 23, 1989, 8900635

Int. Cl.[5] F23G *5/00*

U.S. Cl. 110—248 **9 Claims**



1. A device for melting an inorganic material which is mixed with an organic substance by feeding to the mixture sufficient oxygen enriched gas that the combustion of the organic substance produces sufficient heat to melt the inorganic material, comprising:

a furnace having a wall separating the interior thereof into a melting section for melting the inorganic material and a discharge section for discharging the melted material and combustion waste gases;

lower and upper outlet openings in said wall for respectively permitting the melted material and the waste gases to reach said discharge section;

a bottom outlet and a chimney in said discharge section for respectively discharging said melted material and said waste gas from said discharge section; and

means for injecting the oxygen enriched gas into a boundary layer between the melted material in said melting section and unmelted inorganic material on top of said melted material.

5,179,903

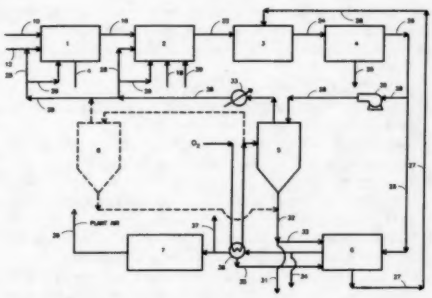
CLOSED LOOP INCINERATION PROCESS

Harry I. Abboud, 5845 Clematis Dr., Baton Rouge, La. 70808, and Chip Efferson, Rte. 2, Box 2445, Ethel, La. 70737

Filed Jun. 24, 1991, Ser. No. 719,799

Int. Cl.[5] F23J *11/00*

U.S. Cl. 110—345 **16 Claims**



1. A process for combusting hazardous waste materials so that substantially all of the contaminants are removed from the resulting flue gas comprising:

(a) feeding combustible waste material into a first combustion zone where they are combusted at a temperature from about 1400° F. to about 2200° F.;

(b) passing the resulting flue gas stream from said first combustion zone to a second combustion zone where they are further combusted at a temperature from about 1800° F. to about 2500° F.;

(c) passing the resulting flue gas stream from said second combustion zone to a cooling zone containing an aqueous solution or slurry containing acid salts or alkaline salts, or both, from a downstream wet gas scrubbing zone, wherein the flue gas stream is cooled by at least 1000° F. with the formation of acid salts;

(d) passing the flue gas/solids mixture from said cooling zone to a separation zone, where the solid material is separated and collected from said flue gas;

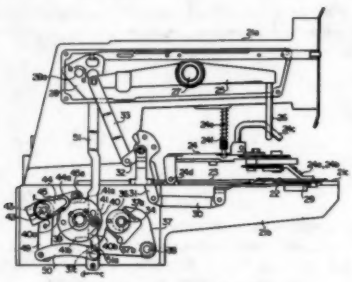
(e) recycling a portion of the flue gas stream, to which oxygen is added to bring the oxygen content of said flue gas stream to at least about 20 volume, to said first combustion zone and/or second combustion zone; and

(f) passing the remaining portion of said flue gas to a wet scrubbing zone, containing an aqueous alkaline solution or slurry, wherein acid gases and residual particulates are removed.

5,179,904
CYCLE SEWING MACHINE

Yuhei Hoyano, and Masahiko Sato, both of Tokyo, Japan, assignors to Juki Corporation, Chofu, Japan

Filed Jul. 19, 1991, Ser. No. 732,646
Claims priority, application Japan, Jul. 20, 1990, 2-192569
Int. Cl.[5] D05B *3/00*
U.S. Cl. 112—67 **3 Claims**



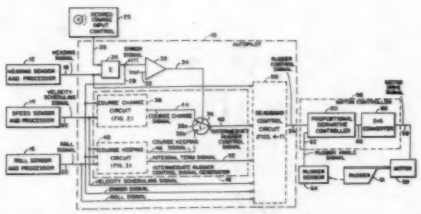
1. A cycle sewing machine comprising:
a main shaft;
clutch means for connecting said main shaft to a driving source, said clutch means having a breaking cam fixed to said main shaft;
a breaking lever movable to engage with said breaking cam to lock said main shaft at a predetermined position;
an eccentric cam rotatable in synchronization with said main shaft;
a rocking link driven by said eccentric cam;
an operative rod selectively moved into engagement with said rocking link and driven by said rocking link;
a mirror link driven by said operative rod to rotate in a clockwise and in a counterclockwise direction;
a lift lever connected at one end thereof to said rotary link to move in response to said clockwise and counterclockwise rotary link rotation;
a button holder connected to the other end of said lift lever to enable said button holder to be lifted thereby;
a plurality of links coupled to said rotary link for movement in response to said clockwise and counterclockwise rotary link rotation;
a thread trimming mechanism driven by said rotary link and said plurality of links coupled to said rotary link which act in association therewith;
a drive control shaft rotatable in synchronization with said main shaft to effect one rotation per a cycle of a sewing operation, said drive control shaft having a first control cam and a second control cam;
first control means driven by said first control cam for driving said clutch means to connect said main shaft to said driving source; and
second control means driven by said second control cam whereby said second control cam brings said operative rod into said selective engagement with said rocking link and brings said breaking lever into engagement with said breaking cam.

5,179,905
ADAPTIVE AUTOPILOT

Robin C. Hossfield, Medway, and Joseph R. Adamski, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 19, 1991, Ser. No. 794,752
Int. Cl.[5] B63H *25/04*
U.S. Cl. 114—144 E **4 Claims**

1. A marine autopilot for use on a vessel having a rudder and a source of an actual vessel heading signal, said autopilot comprising:
operator actuable control means for providing a signal corresponding to a desired course for said vessel;
course keeping means for generating a course keeping signal to maintain said vessel on the desired course;

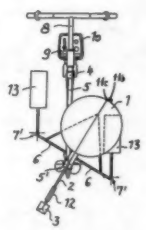


means coupled to the vessel for sensing the frequency of the roll of the vessel and for generating a roll frequency scheduling signal; and
means for adjusting said course keeping signal in response to said roll frequency scheduling signal.

5,179,906
WATERCRAFT

Hans H. Kattwinkel, Burgweg 66, and Marcus Kattwinkel, Wiesenstr. 4, both of D-5884 Halver, Fed. Rep. of Germany

PCT No. PCT/DE88/00576, § 371 Date May 10, 1990, § 102(e) Date May 10, 1990, PCT Pub. No. WO89/04793, PCT Pub. Date Jun. 1, 1989
PCT Filed Sep. 16, 1988, Ser. No. 499,312
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3738617
Int. Cl.[5] B63B *35/73*
U.S. Cl. 114—270 **8 Claims**



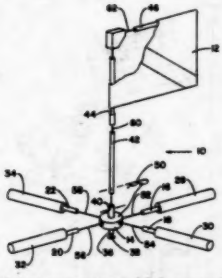
1. A watercraft, comprising:
a float;
a support frame attached to said float;
a ballast attached to said support frame and spaced below said float;
a pair of upright stanchions spaced apart in a direction of travel and pivotally connected to said support frame between said float and said ballast at a pivot axis parallel to said direction;
a beam extending in said direction, rigidly connected to said stanchions and spaced above said float;
a passenger seat on said beam;
a steering mechanism operatively connected to said beam and effective for steering the watercraft;
a control on said beam operatively connected to said mechanism for operating same; and
a pair of rigid support arms extending perpendicular to said direction and to said axis from opposite sides of said support frame and rigid therewith for displacement by legs of a passenger on said seat to shift said ballast and float angularly about said axis and relative to said beam and said stanchions.

5,179,907

FLAG AND BUOY APPARATUS

Patricia Galbraith, 43204 Wolverine, Shawnee, Okla. 74801

Filed Oct. 28, 1991, Ser. No. 783,325
Int. Cl.[5] G09F *17/00*; B63B *45/00*
U.S. Cl. 116—209 6 Claims



1. A flag and buoy apparatus which comprises:

a body having a plurality of receptacles recessed into said body;

a plurality of buoyant arms, each arm receivable in one of said receptacles and extending radially from said body; flexible, stretchable cord means extending between each said arm and said receptacles to maintain each arm in close proximity to said receptacles when disassembled or dislodged;

a flag; and

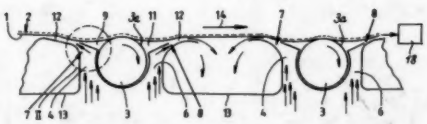
pole means extending axially from said body to support said flag, said pole means attachable to said body by means for receiving said pole means, wherein said arms and said pole means may be attached to said body for use and detached from said body for storage of said apparatus.

5,179,908

APPARATUS FOR DRYING A MOISTURE-CONTAINING LAYER AT ONE SIDE OF A RUNNING SUBSTRATE

Albert Hebels, Kellinghusen, Fed. Rep. of Germany, assignor to Pagendarm GmbH, Hamburg, Fed. Rep. of Germany

Filed Apr. 9, 1991, Ser. No. 682,723
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1990, 4012176
Int. Cl.[5] F26B *3/00*
U.S. Cl. 118—68 7 Claims



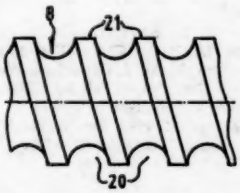
1. Apparatus for treating a coated web-shaped running substrate which has a coated side and an uncoated side and is advanced in a predetermined direction along a predetermined path, comprising at least one rotary idler roller adjacent a predetermined portion of said path at the uncoated side of the substrate; means for directing a compressed gas against the uncoated side of the substrate adjacent said at least one idler roller upstream and downstream of said predetermined portion of said path, including a first venturi upstream and a second venturi downstream of said predetermined portion of said path, said first venturi having at least one orifice which discharges gas counter to said direction and said second venturi having at least one orifice which discharges gas in said direction; and means for conditioning the gas before the gas contacts the uncoated side of the substrate in said path.

5,179,909

DEVICE FOR DOSING COATING SUBSTANCES ON A TRAVELING WEB OF PAPER OR CARDBOARD OR THE LIKE

Hans-Peter Sollinger, Heidenheim, Fed. Rep. of Germany, assignor to J.M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Division of Ser. No. 582,259, Sep. 13, 1990, Pat. No. 5,101,760, which is a division of Ser. No. 385,212, Jul. 25, 1989, Pat. No. 4,980,207. This application Sep. 25, 1991, Ser. No. 765,150
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1988, 3825412
Int. Cl.[5] B05C *11/02*
U.S. Cl. 118—119 4 Claims



1. A device for dosing coating substances onto a traveling web of paper, cardboard and the like, comprising:

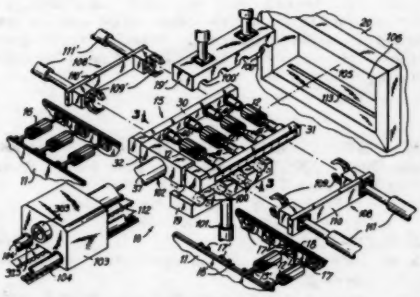
a doctor roll having circumferential grooves which are separated from each other by lands, each of said lands having a surface parallel to the center axis of said roll when viewed in the direction of said center axis, said circumferential grooves having an overall cross-section per meter of working width of said doctor roll of maximally 34 mm^2, wherein the respective widths of said lands, viewed in said center axis direction, maximally equals the maximum width of the cross section of the circumferential grooves.

5,179,910

APPARATUS FOR APPLYING A POWDERED COATING TO A WORKPIECE

Sandor Habsburg-Lothringen, Hernstein, Austria, assignor to Axis USA, Incorporated, Marlborough, Mass.

Filed Feb. 27, 1991, Ser. No. 661,830
Int. Cl.[5] B05C *19/00*
U.S. Cl. 118—634 12 Claims



1. Apparatus for application of a powdered curable coating to a workpiece, said workpiece having a shaft projecting therefrom, said apparatus comprising:

a treatment station, said treatment station including coating means; and

means for gripping said workpiece, said gripping means comprising:

means for engaging over and holding said shaft, and

means for urging said engaging and holding means over said shaft, said engaging and holding means comprising a locking cylinder having a hollow core having a diameter greater than the diameter of said shaft for admitting said shaft, said locking cylinder having a frustoconical outer surface whose diameter decreases in a direction away from said workpiece, said engaging and holding means further comprising a camming cylinder further from said workpiece than said locking cylinder; whereby:

when said engaging and holding means is engaged over said shaft, and said urging means urges said engaging and holding means over said shaft, said camming cylinder cooperates with said frustoconical surface to wedge said locking cylinder against said shafts, thereby holding said shaft.

5,179,911

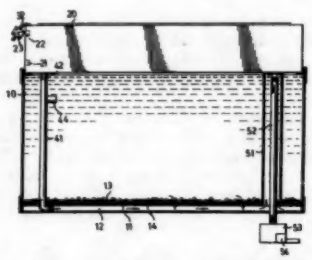
AQUARIUM HAVING A CLEANING APPARATUS

Hong-Jien Chow, 4th Fl., No. 5, Chingcheng Wu St., Taichung city, and Yi-Min Jian, No. 5, Tali Rd., Sijung Village, Tali Hsiang, Taichung County, both of Taiwan

Filed Apr. 16, 1992, Ser. No. 868,857

Int. Cl.[5] A01K *63/00, 63/04*

U.S. Cl. 119—5 **7 Claims**



1. An aquarium comprising a housing, a screen disposed on a lower portion of said housing so that a space is formed below said screen, a tank for containing water, a conduit coupling said tank to said housing and including a first mouth communicated with said space and a second mouth communicated with said housing for supplying said water from said tank to said housing and to said space respectively, an outer tube vertically disposed in said housing distal from said conduit and including a lower end communicated with said space, and an inner tube disposed in said outer tube and including a lower end extended outward of said housing and an open upper end; whereby, said water contained in said space is forced to flow into said outer tube and to flow out of said housing via said open upper end of said inner tube when water is supplied into said housing and said space from said tank.

5,179,912

WASTE-RECEIVING PLATE FOR CHICKEN CAGES

Chuan-Chin Wu, No. 150, Yung-Hsing Lane, Nei Pu Hsiang, Ping Tung Hsien, Taiwan

Filed Jul. 29, 1992, Ser. No. 921,243

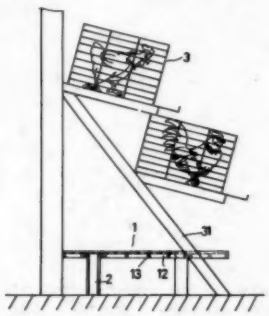
Int. Cl.[5] A01K *31/00*

U.S. Cl. 119—22 **3 Claims**

1. A waste-receiving plate in combination with chicken cages comprising;

a plate member having a plurality of small holes formed as net holes, a plurality of straight parallel ribs extending downward in lengthwise and lateral direction, two large notches at both ends of a side, and four receptacles respectively having two opposite projections on an inner peripheral surface spaced apart; four feet fitting into the receptacles of the plate member to support the plate member above the ground, and respectively having two opposite L-shaped slots in an upper peripheral edge for the projections of the receptacle in the plate member to engage therein; and

said feet being rotated to let the projections of the receptacles in said plate member move in left halves of a horizontal portions of the L-shaped slots in said feet so that said



feet are kept secured in position, and said notches in the plate member contacting a predetermined point of an inclined post of the chicken cages to secure said plate member in a horizontal position supported by said feet, and said plate member being located between chicken cages and the ground to receive chicken wastes.

5,179,913

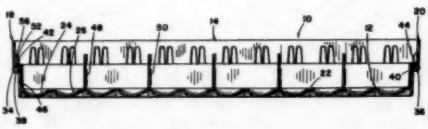
METHOD AND APPARATUS FOR INCUBATING AND HATCHING EGGS

Robert W. Cannon, Salem, Oreg., assignor to The Marmon Corporation of Canada, Ltd., Canada

Filed Sep. 4, 1990, Ser. No. 577,257

Int. Cl.[5] F22B *11/00*

U.S. Cl. 119—43 **16 Claims**



1. A method for incubating and hatching eggs comprising the steps of:

placing a plurality of eggs on a horizontal egg support surface provided with a plurality of curved surfaces,

positioning each egg so that the longitudinal axis of the egg forms an acute angle relative to the egg support surface with the air-cell end of the egg being higher than the other end;

immobilizing each egg relative to the egg support surface in one of said curved surfaces; and

incubating the eggs until the hatch.

5,179,914

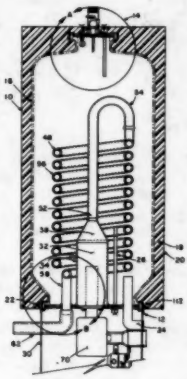
FORCED DRAFT WATER HEATER WITH AN IMPROVED TANK STRUCTURE AND A METHOD FOR MAKING WATER HEATERS

Henry J. Moore, Jr., Playa del Rey; Bijan Gidanian, Granada Hills, and Myron E. Deneau, Santa Monica, all of Calif., assignors to Mor-Flo Industries, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 767,413, Sep. 30, 1991. This application Oct. 30, 1991, Ser. No. 784,887

Int. Cl.[5] F22B *5/00*

U.S. Cl. 122—17 18 Claims



1. A water heater comprising:

a generally cylindrical, non-metallic tank having a large bottom opening having a bottom opening minimum diameter, a top opening and an imperforate generally cylindrical side wall;

a body of insulation substantially surrounding said tank;

a metallic bottom plate adapted to close said tank bottom opening having an upwardly facing inside and a downwardly facing outside;

a metallic combustion chamber wall enclosing a combustion chamber fixed to said bottom plate;

a cold water inlet tube passing through and fixed to said bottom plate;

a products of combustion outlet passing through and fixed to said bottom plate;

bottom fixing means fixing said bottom plate to said tank closing said bottom opening;

a burner disposed within said combustion chamber;

a circular opening in said bottom plate disposed beneath said burner;

means supplying air and fuel to said burner;

means fixing said air and fuel supplying means to said bottom plate; and,

exhaust means communicating said combustion chamber to said products of combustion outlet.

5,179,915

ANATOMICALLY MATCHING INTRAMEDULLARY ALIGNMENT ROD

Robert C. Cohen, Rockaway; Scott V. Cron, Rahway, both of N.J., assignors to Osteonics Corporation, Allendale, N.J.

Filed Jan. 6, 1992, Ser. No. 818, 635

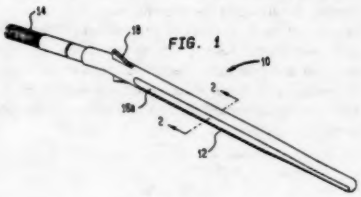
Int. Cl.[5] A61F *5/04*

U.S. Cl. 606–62 14 Claims

1. A tool guide support rod for supporting a tool guide or a tool, said rod comprising:

an elongate internal portion for insertion into the medullary canal of a bone, said internal portion being at least about eight (8) inches in length and having a distal end and a proximal end;

said internal portion having at least two sections, each being of a different cross-sectional size, the smallest of said at least two sections being at said distal end and being approximately .25 inches in cross-sectional size and being provided



along a minor portion of the length of said internal portion such that the smallest section normally avoids an interference fit with the medullary canal, and the larger of said at least two sections being sufficiently large so as to provide a rigid support for the tool guide or tools; and

means for receiving a cutting tool guide or cutting tool, said means being at said proximal end of said internal portion.

5,179,916

PISTON WITH A ROTATABLE PISTON TOP

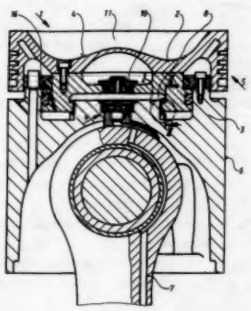
Dieter Schönfeld, Markdorf, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 31, 1991, Ser. No. 806,357

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1990, 4041637

Int. Cl.[5] F02B *75/04*

U.S. Cl. 123—48 B 8 Claims



1. A variable compression internal-combustion engine piston having a rotatable piston top head part with a piston ring zone;

a piston bottom skirt part connected to a connecting rod,

the piston top part, being movable upward and downward with respect to the piston bottom part;

the piston top part being provided with a first threaded section which engages with a first counterthreaded section on the piston bottom part, the improvement comprising:

the first threaded section and the first counterthreaded section are constructed as multiple coarse pitch threads;

the first threaded section and the first counterthreaded section causing the piston top part to rotate during an upward movement of the piston top part with respect to the piston bottom part;

a second threaded section with an opposed pitch is arranged on the piston top part;

said second threaded section engages a second counterthreaded section on the piston bottom to cause the piston top part, during a downward movement of the piston top part to perform a rotation in the same direction as during the upward movement; and

wherein during a reversal of movement of the piston top part, movement takes place between engaged threaded sections and counterthreaded sections so that one of the threaded section is displaced with respect to its perspective counterthreaded section in a circumferential direction.

5,179,917

INTAKE AIR CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

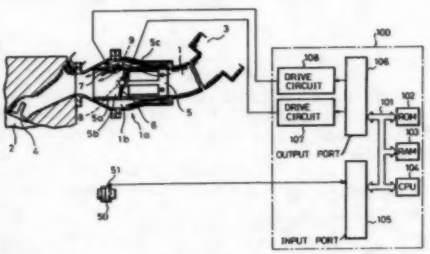
Yuichi Hokazono, and Toshiaki Konomi, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 14, 1992, Ser. No. 882,706

Claims priority, application Japan, May 21, 1991, 3-116255

Int. Cl.[5] F02M *9/12*; F02B *29/02*

U.S. Cl. 123—52 MF **12 Claims**



1. An intake air control device for an internal combustion engine comprising:

an intake passage having a predetermined length and a substantially uniform section, except for an enlarged portion relatively close to an intake valve;

a reed valve assembly arranged in said enlarged portion, and having side walls which divide an inside space of said enlarged portion into a first space surrounding said side walls and a second space surrounded by said side walls, to provide a section similar to said uniform section, and on which are mounted reed valves allowing an intake air to flow only from upstream to said first space;

closing means for normally closing said second space downstream of said reed valves;

communicating means for normally communicating said first space with said second space downstream of said closing means;

first detection means for detecting a current engine speed condition;

first control means for controlling said closing means in response to said current engine speed condition, to open said second space when the current engine speed condition is a high engine speed condition; and

second control means for controlling said communicating means in response to said current engine speed condition, to interrupt said first space with said second space when the current engine speed condition is a high engine speed condition.

5,179,918

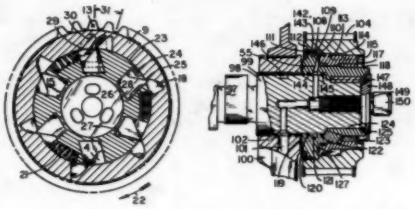
TIMING-RANGE GEAR

John S. Gyurovits, 2256 Brookside Dr., Martinsville, N.J. 08836-9659

Filed Jun. 26, 1991, Ser. No. 721,400

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.17 **25 Claims**



1. A variable valve timing device used as a compact integral part of an internal combustion engine for adjusting a relative angular position of a driven camshaft having a central longitudinal axis with respect to an angular position of a driving crankshaft, said device includes a camshaft gear means comprising:

a hub member, having an axial bore for removably interfacing the camshaft, and having a circular load-bearing periphery and a first cavity means for receiving and comparatively interacting with a corresponding slidable means;

an outer ring gear means in a phased relation to a driving gear means of the crankshaft, having a bore with a circular inner surface coaxial to and in rotatably slideable contact with the load-bearing periphery of said hub member, and having second cavity means therein;

said slideable means include at least one member with a phasing surface, slideably disposed within said first cavity means of said hub member, and said phasing surface slideably engaging a corresponding trailing surface in the second cavity means of said outer ring gear member, wherein a sliding action of the slideable means is translated into angular displacement between said hub and said outer ring gear.

20. A variable valve timing device of an internal combustion engine for adjusting relative angular position between a crankshaft and a camshaft having a central longitudinal axis wherein:

a pulley means having a circular periphery with teeth by which in a phased relation to a driving pulley of the crankshaft is being driven through a flat and toothed timing belt means, a first planar side being adjacent to a camshaft support means, a second side forward from said first side being substantially parallel thereto, a first bore extending longitudinally inward from said first side to a first planar bottom surface thereof, a second bore being concentric to said first bore and extending forward from the bottom surface thereof to a second planar surface that is perpendicular thereto, a third bore from said second planar surface extending through said pulley means and at least one inside helical groove cut into the periphery of said third bore throughout the length thereof, an inside groove circumferentially cut within said first bore being substantially near said first side;

a hub member having a first load-bearing circular periphery concentric to the longitudinal axis and a length substantially equal to the space between an inner edge of the inside groove and the first bottom surface in rotatably sliding contact with the periphery of said first bore of said pulley member, a first outer planar surface being perpendicular to the periphery and extending centerward therefrom, a second outer planar surface, a first inner planar surface extending centerward from said periphery and being perpendicular thereto, a shallow undercut extending longitudinally from the inner planar surface toward the

first outer surface and having a flat bottom surface perpendicular to said periphery, a second concentric load-bearing periphery smaller in diameter than said first periphery extends from said undercut outward therefrom, a third concentric load-bearing periphery reduced in diameter extends to the outer end of the hub and having at least one outside helical groove cut thereon through the length of said periphery, a circumferential flat-bottom groove cut in said first periphery near the first outer planar surface, a first bore concentric to said periphery extending longitudinally inward from said first side and having a first inside flat-bottom groove concentric to the longitudinally axis in close proximity to an outer edge thereof, a second inside groove larger than said first groove therein, a third inside groove identical to the first inside groove being concentric to the longitudinal axis and in close proximity to an inner bottom surface of said first bore, a second inside bore concentric to the longitudinal axis through the hub member and having an inside keyway longitudinally cut therein, an angular end surface extends outward therefrom, at least one passageway angularly extending through the flat bottom of said under cut and intersects the second inside groove within said first bore;

an annular piston means comprising: a first load-bearing circular periphery concentric to the longitudinal axis and in rotatable sliding contact with the periphery of the second bore of said pulley member, a second circular load-bearing periphery concentric to the longitudinal axis being smaller in diameter than said first periphery and concavely conjoined thereto, a first load-bearing bore concentric to said first periphery and in rotatable sliding contact with the second load-bearing periphery of said hub member, a piston head being annular and extending centerward from said first periphery to said first bore, an outside flat-bottom groove circumferentially cut into said first periphery, an inside flat-bottom groove circumferentially cut into the periphery of said first bore, a second load-bearing bore extending forward from a bottom of said first bore and concentric thereto, at least one outside helical spline means extending forward from the end of said first periphery to an outer end of said piston means and convolutional with the inside helical groove within the third bore of said pulley member, at least one inside helical spline rising centerward from the load-bearing surface of said second bore and extending the full length thereof and convolutional with the outside helical groove within the third load-bearing periphery of said hub member;

the camshaft having an end journal extending beyond the bearing support therefor, a reduced diameter end portion extend outward from the end of said journal and coaxial thereto, a keyway longitudinally cut into the periphery of said reduced diameter end, a first hole concentric to the longitudinal axis leading inward from the outer end of said reduced diameter end and having a threaded portion therein, a blind hole coaxial to said first hole, a first passageway leading inward from the periphery of said journal and in communication with said blind hole and oil-pressure supply port within said bearing support means, a second passageway substantially near the reduced diameter end of said journal leading inward from the periphery and in communication with the first hole and the second inside groove within the first bore of said hub member, a key longitudinally interfaced within the keyways therefor in said hub and the reduced diameter portion of the camshaft, a circular end plate having a periphery substantially coangular with the end of said hub member and a cavity which interlockingly receives the overhanging end of said key thereinbetween.

5,179,919

WIRE LOOM MOUNTING

Gilbert H. Foltz, Jr., Mesa, and Stephen A. Harding, Chandler, both of Ariz., assignors to Mr. Gasket Company, Cleveland, Ohio

Filed Nov. 8, 1991, Ser. No. 789,666
Int. Cl.[5] H02G *3/26*; F02P *1/00, 23/00*
U.S. Cl. 123—143 C **6 Claims**

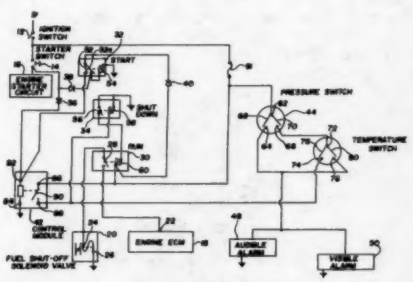
1. The combination of a cylinder head, a header seated on said cylinder head, a header flange body disposed between said cylinder head and said header and having at least one projection from said flange body, a non-circular aperture in said projection and means for attaching an ignition wire loom to said aperture.

5,179,920

CIRCUIT FOR AUTOMATIC SHUT-DOWN OF ELECTRONICALLY CONTROLLED DIESEL ENGINE

Burnell L. Bender, Woodburn, Ind., assignor to Navistar International Transportation Corp., Chicago, Ill.

Filed Mar. 12, 1992, Ser. No. 849,852
Int. Cl.[5] F02B *77/08*
U.S. Cl. 123—198 DB **7 Claims**



1. An internal combustion engine comprising:

an ignition switch that is selectively operated on and off respectively to respectively connect and disconnect electric current from an electric power source to and from circuitry associated with the engine,

a fuel shut-off solenoid valve that is selectively operable to open and close a fuel supply to the engine, said fuel shut-off solenoid valve being closed and open respectively by the absence and presence respectively of energizing current to it,

an electronic engine control module for exercising control over certain engine functions including control of said fuel shut-off solenoid valve by commanding said energizing current to be supplied to said fuel shut-off solenoid valve via a current path between said electronic engine control module and said fuel shut-off solenoid valve, said electronic engine control module having a diagnostic mode, operative with the engine not running but with the ignition switch on, requiring continuity of said current path to said solenoid valve; and

an engine shut-down circuit operative with the engine run-

ning and the ignition switch on but functioning separately from said electronic engine control module for shutting the engine down upon the occurrence of one or more conditions indicative of a need to stop the engine for the purpose of avoiding permanent damage thereto, said shut-down circuit including:

one or more detection sensors for detecting the occurrence of said one or more conditions,

switch means interposed in said current path between said electronic control module and said fuel shut-off solenoid valve,

an electrical connection between said ignition switch and an operating means associated with said switch means,

shut-down switch means effective when said ignition switch is on and the engine is running to cause said switch means to maintain said current path closed prior to said one or more detection sensors detecting said one or more conditions, said shut-down switch means effective upon said one or more detection sensors detecting said one or more conditions to cause said switch means to open said current path, thereby interrupting said energizing current and causing said fuel shut-off solenoid valve to close and shut off fuel to the engine; and

means causing said switch means to be closed when the engine is not running and said ignition switch is on.

5,179,921

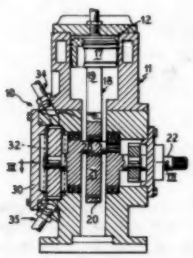
INTEGRATED ENGINE AND COMPRESSOR DEVICE

Vincent Figliuzzi, W8724 White Crow Rd., Fort Atkinson, Wis. 53538

Filed Jan. 30, 1992, Ser. No. 828,017

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—198 C **10 Claims**



1. A combination piston engine and rotary machine comprising: a piston reciprocally movable in a cylinder having fluid inlet and outlet connections thereto, a pair of oppositely rotatable crankshaft means disposed on opposed sides of the longitudinal axis of said cylinder within a crank case, each crankshaft means having an element intersecting with a longitudinal plane of said cylinder, a one-piece translator connected to said piston, engaged by said elements and disposed in said longitudinal plane extending from said cylinder into said crank case for moving in a true straight line motion along said longitudinal axis, and a rotary unit comprising a pair of intermeshing gear wheels disposed in an enclosed casing separate of said crank case and connected to said elements for coinciding the rotation of said pair of crankshaft means, said casing having fluid inlet and outlet connections thereto, whereby said rotary unit functions to coincide the rotation of said engine crankshaft means and operate as an expansible-chamber, fluid machine.

5,179,922

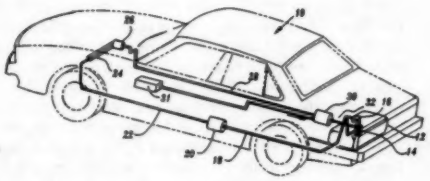
APPARATUS FOR DETERMINING CHANGE OF FUEL FLOW

Donald D. Bartholomew, Mt. Clemens, Mich., assignor to Proprietary Technology, Inc., Mt. Clemens, Mich.

Filed Nov. 15, 1990, Ser. No. 614,592

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—198 DB **21 Claims**



1. A fuel system comprising:

a fuel tank for holding a certain quantity of fuel;

at least one fuel line connected to said fuel tank; and

means for determining a total flow of fuel through said at least one fuel line relative to a predetermined value, at a single point, so as to indicate a malfunction of the total fuel flow in said fuel system.

5,179,923

FUEL SUPPLY CONTROL METHOD AND ULTRASONIC ATOMIZER

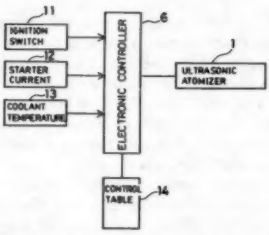
Kazushi Tsurutani; Daijiro Hosogai; Kakuro Kokubo; Taiji Kobayashi; Noboru Higashimoto; Masami Endoh; Kazuyoshi Namiyama, and Makoto Yoneda, all of Ooi, Japan, assignors to Tonen Corporation, Tokyo, Japan

Filed Jun. 29, 1990, Ser. No. 545,787

Claims priority, application Japan, Jun. 30, 1989, 1-168633; Jun. 30, 1989, 1-168634; Jun. 30, 1989, 1-168635

Int. Cl.[5] F02D *41/06*

U.S. Cl. 123—435 **3 Claims**



1. In a method of driving an engine wherein a fuel is atomized by an ultrasonic atomizer and carried by a stream of air to a combustion chamber where atomized fuel is ignited by a spark, a fuel supply control method comprising the steps of:

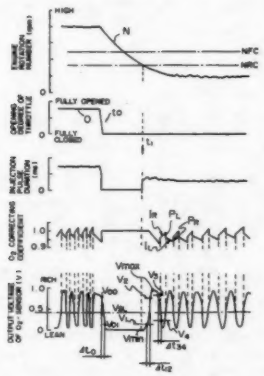
controlling a fuel supply pattern at least at a time of starting the engine, wherein the fuel is continuously injected where the engine is started in low-temperature conditions, and

when said continuous fuel injection is performed, fuel feed pressure is lowered.

5,179,924
METHOD AND APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

Toshio Manaka, Ingolstadt, Fed. Rep. of Germany, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 31, 1991, Ser. No. 708,227
Claims priority, application Japan, Jun. 1, 1990, 2-141397
Int. Cl.[5] F02D *41/14*
U.S. Cl. 123—682 **8 Claims**

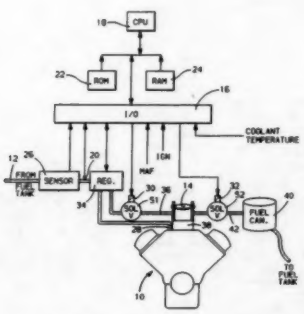


1. A method of controlling air-fuel ratio of a gas mixture of air and fuel supplied to an internal combustion engine, in which an actual air-fuel ratio is determined on the basis of exhaust gas components of said engine by using air-fuel ratio detecting means installed in an exhaust gas system of said engine, the air-fuel ratio of said gas mixture to be supplied to said engine being controlled through a feedback control on the basis of deviation of said actually determined air-fuel ratio from a reference value thereof, said control method comprising a step of making a decision as to performance of said air-fuel ratio detecting means by making use of a change in the air-fuel ratio detection output of said air-fuel ratio detecting means at the time of at least one of interruption and restart of the fuel supply to said internal combustion engine.

5,179,925
HOT RESTART COMPENSATION

John K. Orminski, Ontario, Canada, assignor to General Motors of Canada Limited, Oshawa, Canada

Filed Jan. 30, 1992, Ser. No. 827,792
Int. Cl.[5] F02D *41/06*
U.S. Cl. 123—491 **6 Claims**



1. A method of controlling hot restart fuel delivery to an internal combustion engine having fuel injectors for injecting metered quantities o fuel to the engine, the method comprising the steps of:

locating a temperature sensor at a predetermined location at which the sensor is heated by the engine;

storing in a memory a schedule of hot restart temperature threshold values as a predetermined function of restart values of the temperature sensor at the predetermined location;

sensing a shutdown temperature of the temperature sensor at engine shutdown and at the predetermined location;

sensing a restart temperature of the temperature sensor at initiation of engine starting and at the predetermined location;

retrieving the hot restart temperature threshold value from the memory corresponding to the sensed restart temperature;

determining a hot restart fuel adjustment amount when the sensed restart temperature is greater than the sensed shutdown temperature by an amount greater that the retrieved hot restart temperature threshold value;

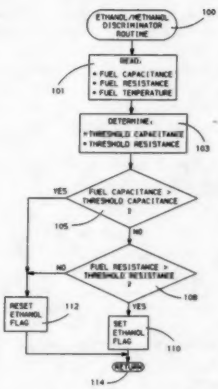
determining a fuel command value equal to a predetermined base restart fuel amount adjusted by the determined hot restart adjustment fuel amount; and

controlling the fuel injectors to deliver fuel to the engine in accord with the determined fuel command value.

5,179,926
ALCOHOL DISCRIMINATOR AND FUEL CONTROL FOR AN INTERNAL COMBUSTION ENGINE FUELED WITH ALCOHOL-GASOLINE FUEL MIXTURES

Frank Ament, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 18, 1992, Ser. No. 836,579
Int. Cl.[5] F02D *41/04*; G01N *33/22*
U.S. Cl. 123—494 **13 Claims**



11. A fuel control system for an internal combustion engine operated on an alcohol-gasoline fuel mixture, the fuel control system comprising:

a resistive sensor for measuring the resistivity of the fuel mixture and for developing a resistance signal indicative of fuel mixture resistivity;

a capacitive sensor for measuring the dielectric constant of the fuel mixture and for developing a capacitance signal indicative of the fuel mixture dielectric constant;

means responsive to the resistance and capacitance signals for determining the type and concentration of alcohol in the fuel mixture;

means for controlling the quantity of fuel mixture delivered

to the engine in accordance with the determined type and concentration of alcohol in the fuel mixture.

5,179,927

INJECTION-TYPE COMBUSTION ENGINE WITH ELECTRIC SPARK IGNITION AND A HEATING SYSTEM

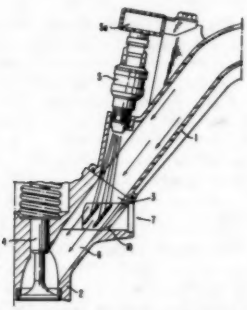
Jürgen Henke, Wernau; Erwin Spinner, Leinfelden, and Peter Früh, Weinstadt, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Sep. 30, 1991, Ser. No. 767,903

Claims priority, application Netherlands, Sep. 28, 1990, 9002129

Int. Cl.[5] F02M *31/00*

U.S. Cl. 123—549 **3 Claims**



1. An injection-type combustion engine with electric spark ignition, comprising at least one cylinder head provided with an air intake duct, at least one intake valve provided in the cylinder head, at least one fuel injector, and a heating element mounted downstream of the at least one fuel injector as viewed in a direction of intake air flow and having a heat sink configured as a hollow flat box and at least one PTC-pellet associated therewith, wherein the heating element is inserted through an opening in a wall of the air intake duct so as to project into the air intake duct such that a wall of the box configured heating element extends transversely with respect to the intake air flow and has at least one fin projecting away from the box configured heating element to extend substantially in parallel to the intake air flow in the air intake duct and having a surface facing the fuel injector such that the fuel is sprayed onto the surface of the fins facing the fuel injector.

5,179,928

INTERNAL COMBUSTION ENGINE IGNITION DEVICE

Marie M. H. Cour, Portet-sur-Garonne, and Raymond F. J. Vernieres, Villefranche-de-Lauragais, both of France, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

PCT No. PCT/EP90/01013, § 371 Date Feb. 24, 1992, § 102(e) Date Feb. 24, 1992, PCT Pub. No. WO91/00961, PCT Pub. Date Jan. 24, 1991

PCT Filed Jun. 25, 1990, Ser. No. 809,483

Claims priority, application France, Jul. 13, 1989, 89/09489

Int. Cl.[5] F02P *3/06*

U.S. Cl. 123—606 **12 Claims**

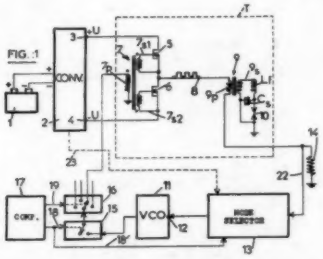
1. In an internal combustion engine with a spark plug having electrodes between which an arc is formed for igniting an air-fuel mixture in a cylinder, an engine ignition device comprising:

means for providing direct current voltages;

a first transformer having a primary winding and a secondary circuit having first and second secondary windings wound in mutual phase-opposition forming a first transformer secondary circuit output;

said first transformer secondary circuit output including two electronic switches respectively connected in series between said voltages from said direct current voltage means, each switch being controlled by a respective one of said first and second secondary circuits of said first transformer;

a high voltage generator for selectively supplying the spark plug for triggering an ignition arc, said high voltage generator including a resonant circuit supplied by said first transformer secondary circuit output at a resonant frequency of said resonant circuit for supplying the spark plug with a resonance-amplified voltage suitable for causing an ignition arc between the electrodes of the spark plug;



said high voltage generator further including a second transformer having primary and secondary circuits and being connected between said first transformer and the spark plug;

said resonant circuit being connected between said second transformer and the spark plug and being formed by a series inductance in said secondary circuit of said second transformer and a parallel capacitance on the spark plug;

measuring means for detecting a current in said primary circuit of said second transformer; and

an oscillator for supplying said primary circuit of said first transformer the frequency of said oscillator being controlled according to the detected current in said primary winding of said second transformer.

5,179,929

METHOD OF DETECTING DETERIORATION OF EXHAUST GAS INGREDIENT CONCENTRATION SENSOR

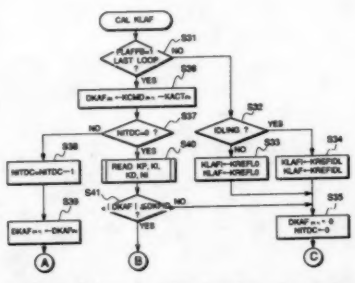
Yukio Miyashita; Hiroshi Ohno; Kunio Noguchi, and Hironao Fukuchi, all of Wako, Japan, assignors to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd, in English), Tokyo, Japan

Filed Nov. 22, 1991, Ser. No. 796,415

Claims priority, application Japan, Nov. 29, 1990, 2-331143

Int. Cl.[5] F02D *41/14*

U.S. Cl. 123—688 **14 Claims**



1. A method of detecting deterioration of an exhaust gas

ingredient concentration sensor for use in controlling an air-fuel ratio of a mixture supplied to an internal combustion engine having an exhaust system in which said sensor is arranged, said sensor having an output characteristic approximately proportional to concentration of a specific ingredient in exhaust gases emitted from said engine, said air-fuel ratio being feedback-controlled to a desired air-fuel ratio by calculating an amount of fuel supplied to said engine by the use of a desired air-fuel ratio coefficient indicative of said desired air-fuel ratio and set in dependence on operating conditions of said engine, and an air-fuel ratio correction coefficient set in dependence on a value of an output from said sensor and said desired air-fuel ratio coefficient, the method comprising the steps of:

(1) calculating a plurality of average values of said air-fuel ratio correction coefficient, respectively, when said desired air-fuel ratio falls within a plurality of predetermined ranges;

(2) comparing between said average values thus calculated: and

(3) determining a degree of deterioration of said sensor from results of said comparison.

5,179,930

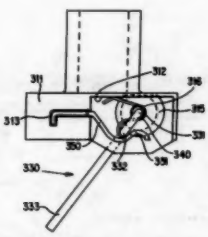
ARROW REST WITH FORWARD AND BACKWARD DEFLECTABLE ARROW SUPPORT ARM

Miroslav A. Simo, 370 N. Delaplaine Rd., Riverside, Ill. 60546

Continuation-in-part of Ser. No. 693,776, Apr. 26, 1991, Pat. No. 5,148,796, which is a continuation of Ser. No. 418,190, Oct. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 170,161, Mar. 18, 1988, Pat. No. 4,881,515, which is a continuation-in-part of Ser. No. 57,383, Jun. 2, 1987, Pat. No. 4,809,670, which is a continuation-in-part of Ser. No. 788,486, Oct. 17, 1985, Pat. No. 4,732,135, which is a continuation-in-part of Ser. No. 482,186, Apr. 5, 1983, Pat. No. 4,548,188. This application May 31, 1991, Ser. No. 710,032

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—44.5 **13 Claims**



1. An arrow rest comprising:

a housing, an arrow support arm having a riser portion and a support portion, said riser portion rotatably mounted with respect to said housing;

a return spring mounted with respect to said arrow support arm to urge said support portion into a rest position;

stop means for limiting normal movement of said support portion in a forward direction from said rest position to a deflected position, said stop means comprising a leaf spring separate from said return spring and secured with respect to said housing; and

release means for allowing said support portion to deflect in a backward direction beyond said rest position of said normal movement and for allowing said support portion to be reset to said rest position.

5,179,931

WORKING GEMSTONES

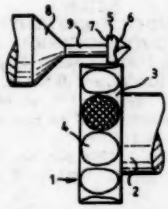
Alec Leibowitz, Edgeware, and Peter Cooke, Maidenhead, both of England, assignors to Brilcut Patentanstalt, Liechtenstein

Filed May 3, 1991, Ser. No. 695,345

Claims priority, application United Kingdom, May 4, 1990, 9010176; Jul. 10, 1990, 9015156

Int. Cl.[5] B28D *5/00*

U.S. Cl. 125—30.01 **26 Claims**



1. A method of working a gemstone workpiece, comprising rotating the workpiece stone about a workpiece stone axis and engaging a surface of the workpiece with a working face of a bruting crown which is rotated about a bruting crown axis, grinding stones set in said working face, each grinding stone having a leading part which is the first part of the grinding stone as the bruting crown rotates and a trailing part which is the last part of the grinding stone as the grinding stone rotates, each grinding stone subtending at the bruting crown axis an angle of at least about 10° between the leading part and the trailing part of the grinding stone.

5,179,932

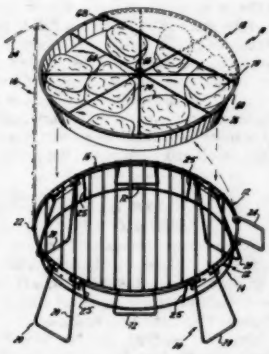
COLLAPSIBLE PICNIC COOK-STOVE

Donald J. DeCarlo, Post Office Box 152, Tarrytown, N.Y. 10591

Filed Jun. 3, 1992, Ser. No. 892,795

Int. Cl.[5] A47J *37/07*; F24B *3/00*; F24C *1/16*

U.S. Cl. 126—9 R **20 Claims**



1. A collapsible picnic cook-stove in combination with a fuel holder for burning fuel;

a) a first support element defining an opening,

b) leg means connected to said first support element for supporting in one position said first support element in spaced relationship with the surface on which the cook-stove is to be used and in another position lie in a plane substantially parallel with the plane of the opening of said first support element;

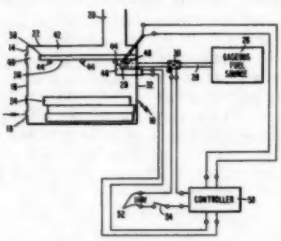
c) a comestible support means supported by said first support element overlying said opening;

d) a second support element for supporting said fuel holder;
e) connecting means for interconnecting the second support element and the first support element so that the second support element is suspended below and in spaced relation to the comestible support means and said opening; and
f) said connecting means including means for permitting said second support element to be moved from the position of suspension of the fuel holder to a position in nested relationship with said first support element.

5,179,933
SINGLE CHAMBER WOOD STOVE INCLUDING GASEOUS HYDROCARBON SUPPLY

Robert C. McCrillis, Durham; Nelson L. Butts, Hillsborough; Wade H. Ponder, Raleigh, and James H. Abbott, Cary, all of N.C., assignors to The United States of America as represented by the Administrator of the Environmental Protection Agency, Washington, D.C.

Filed Nov. 7, 1991, Ser. No. 788,899
Int. Cl.[5] F24C *1/14*
U.S. Cl. 126—77 **39 Claims**



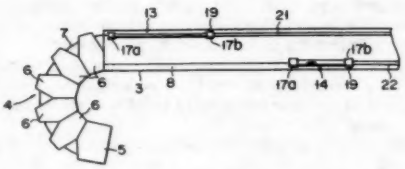
1. In combination, a single combustion chamber wood stove having primary and secondary combustion zones therein in direct fluid flow communication with each other,
means for supplying air to the primary and secondary combustion zones,
a source of gaseous hydrocarbon fuel located outside the stove, and
means responsive to the presence and absence of ignited gases in the secondary combustion zone for controlling the flow of the gaseous hydrocarbon fuel to the secondary combustion zone, the wood stove single combustion chamber being arranged so the gaseous hydrocarbon fuel in the secondary zone and wood in the single chamber both burn in the single chamber, the gaseous hydrocarbon fuel being introduced into the secondary combustion zone in such a manner as to ignite unburned combustible gases leaving the wood being burned in the primary zone.

5,179,934
ENDOSCOPE

Mitsugu Nagayoshi; Atsushi Miyazaki; Hirofumi Miyanaga, all of Hachioji; Sakae Takehana, Machida; Hideyuki Adachi, Hachioji; Yasuhiro Ueda, Kokubunji; Eiichi Fuse, and Yoshisada Aoki, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1991, Ser. No. 655,678
Claims priority, application Japan, Feb. 20, 1990, 2-39018; Nov. 1, 1990, 2-293518; Nov. 9, 1990, 2-305185
Int. Cl.[5] A61B *1/00*
U.S. Cl. 128—4 **35 Claims**

1. An endoscope comprising:
an elongated insertion section including a distal end portion, a proximal end portion, and a bendable portion located between the distal and proximal end portions;
a fluid-pressure actuator, coupled to the insertion section, for bending the bendable portion, said fluid-pressure actuator including: (a) an extensible body defining an internal space and having an extension axis along which the extensible body extends or contracts; and (b) expansion-restricting means for restricting expansion of the extensible body, said expansion-restricting means causing the extensible body to extend in the direction of the extension axis when a fluid is supplied into the internal space, and causing the extensible body to contract in the direction of the extensible axis when the fluid is discharged from the internal space;



conversion means for converting the extension or contraction of the fluid-pressure actuator into a bending motion of the bendable portion of the insertion section; and
fluid supply/discharge means for supplying the fluid into the internal space of the extensible body or discharging the fluid from the internal space.

5,179,935
ENDOSCOPE PROVIDED IN THE INSERTABLE SECTION WITH A FLEXIBLE PART WHICH CAN BE MADE LINEAR

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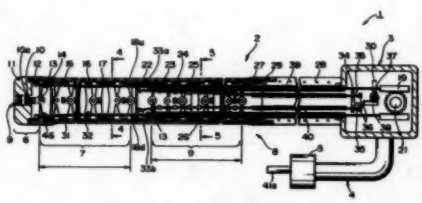
Filed Feb. 19, 1991, Ser. No. 656,652
Claims priority, application Japan, May 17, 1990, 2-129836; Nov. 28, 1990, 2-331921
Int. Cl.[5] A61B *1/06*
U.S. Cl. 128—4 **17 Claims**



1. An endoscope, comprising:
a flexible elongate insertable section insertable into a body cavity or the like, said insertable section having a terminal end which includes a rigid tip;
a light guide inserted through said insertable section and transmitting an illuminating light fed to one end surface and emitting it from the end surface at said terminal end of said insertable section;
an objective optical system provided at said rigid tip at said terminal end of said insertable section and forming an image of an object to be imaged;
a curvable part formed on a base end side of said rigid tip of said insertable section; and
a linearizable flexible part formed on a base end side of said curvable part of said insertable section and settable to be linear by the operation of an operating means provided on a base end side of said insertable section.

5,179,936

DISPOSABLE SPECULUM WITH MEMBRANE BONDING RING

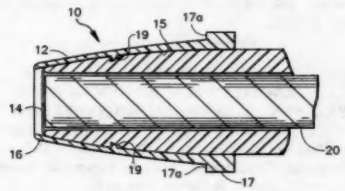
Gary J. O'Hara, Escondido, Calif.; David B. Phillips, Westford, Vt., and Kishan G. Hingorani, Irvine, Calif., assignors to Intelligent Medical Systems, Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 731,795, May 8, 1985, Pat. No. 4,662,360, which is a continuation-in-part of Ser. No. 663,769, Oct. 23, 1984, Pat. No. 4,602,642. This application Apr. 30, 1987, Ser. No. 45,603

The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.[5] A61B *1/22;* G01K *1/08*

U.S. Cl. 128—9 10 Claims



1. A speculum comprising:

a generally tubular body portion having forward and rearward ends;

a membrane extending across the forward end of the tubular body portion, the membrane having a maximum thickness of approximately 0.001 inches and being substantially transparent to infrared radiation; and

a bonding member ring joined to the membrane on a first side thereof opposite a second side which is bonded to the forward end of the tubular body portion.

5,179,937

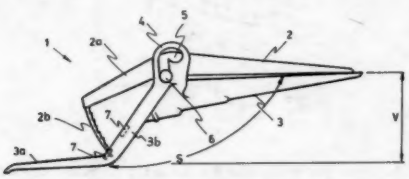
DISPOSABLE VAGINAL SPECULUM

Chenault D. Lee, P.O. Box 363, Wanniassa ACT 2903, Australia

Continuation-in-part of Ser. No. 570,039, Aug. 20, 1990, abandoned, which is a continuation of Ser. No. 499,042, Mar. 26, 1990, abandoned, which is a continuation of Ser. No. 337,303, Apr. 13, 1989, abandoned. This application May 28, 1991, Ser. No. 705,757

Int. Cl.[5] A61B *1/32*

U.S. Cl. 128—17 9 Claims



1. A vaginal speculum, comprising:

a blade assembly having upper and lower pivotally interconnected elongate dilator blade members movable between a closed position at which the blade assembly extends along a longitudinal blade assembly axis and an open position at which said blades are spaced from said blade assembly axis; and,

a handle assembly including upper and lower rearwardly extending and downwardly inclined handle members formed as extensions of said upper and lower blade members respectively, said lower handle member including a first elongate portion proximate said pivotal interconnection and inclined downwardly from said lower elongate dilator blade at a substantially obtuse angle and a second elongate portion inclined rearwardly from said first elongate portion and in substantially parallel alignment with said blade assembly axis, said handle assembly being operable to move said blade assembly between said open and closed positions.

5,179,938

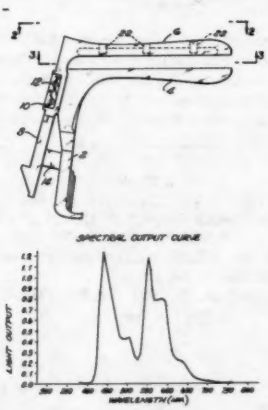
APPARATUS FOR ENDOSCOPIC EXAMINATION OF BODY CAVITY USING CHEMILUMINESCENT LIGHT SOURCE

Neal M. Lonky, Yorba Linda, Calif., assignor to The Trylon Corporation, Torrance, Calif.

Continuation-in-part of Ser. No. 526,770, May 18, 1990, which is a continuation of Ser. No. 20,188, Feb. 26, 1987, abandoned, which is a continuation of Ser. No. 694,092, Jan. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 581,363, Feb. 17, 1983, abandoned. This application Feb. 25, 1991, Ser. No. 660,674

Int. Cl.[5] A61B *1/06*

U.S. Cl. 128—18 19 Claims



1. An apparatus for the detection of various internal disorders in a body cavity which are visually detectable endoscopically, said apparatus comprising a liquid impervious light transmitting body containing therein a chemiluminescent light source for creating a chemiluminescent light in the spectrum comprising at least blue and green wavelengths of light, and combinations thereof, said light transmitting body being sized to be disposed within the cavity to be examined, said light source creating a diffused light which illuminates said body cavity without producing any substantial shadows and wherein said spectrum allows enhanced visualization of said various internal disorders.

5,179,939

PASSIVE ANATOMIC SHOULDER EXERCISER

T. L. Donovan, Lompoc, and R. J. Allemandi, Sunnyvale, both of Calif., assignors to Sutter Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 572,557, Aug. 27, 1990, abandoned. This application Jul. 31, 1991, Ser. No. 739,052

Int. Cl.[5] A61H *1/02*

U.S. Cl. 128—25 R 19 Claims

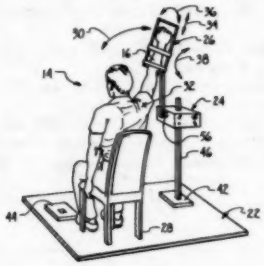
1. A shoulder exerciser comprising:

a base;

a drive means mounted to the base and including a rotatable drive linkage;

an arm holding means for holding a patient's arm including slide mounting means for freely slidably mounting the arm holding means to the drive linkage for permitting the patient's arm to slide towards and away from the patient; and

pivot mounting means for pivotably mounting the arm holding means to the drive linkage for pivoting along a first pivot point in a plane generally orthogonal to a plane of the patient's arm and along a second pivot point in a plane generally parallel to the patient's arm such that the patient's arm can be held by the arm holding means and moved up and down for flexing and abducting the patient's shoulder with the arm holding means freely sliding and pivoting to compensate for anatomical movement and a changing center of motion of the patient's shoulder joint.

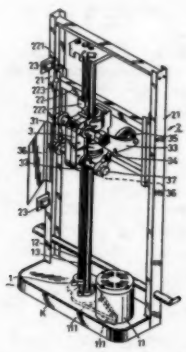


5,179,940

METHOD FOR MASSAGING THE SPINAL AREA AND ADJACENT BACK MUSCLES IN AN IMPROVED KNEADING MOTION

Armando Barreiro, Miami, Fla., assignor to Swerve Systems, Inc., Albuquerque, N. Mex.

Filed Mar. 28, 1991, Ser. No. 676,541
Int. Cl.[5] A61H *1/00*
U.S. Cl. 128—33 **1 Claim**



1. A method for applying a mechanical massage while the back of a user is against the back rest of a chair or lying on a bed, said method using a massage mechanism unit having a pair of spaced apart wheel support means and a massaging wheel rotatably supported on one end of each of said wheel support means, said method comprising the steps of:

(a) positioning said massaging wheels against the back of the user on opposite sides of the spinal column;

(b) simultaneously moving and turning said massaging wheels in the same direction from left to right and right to left while moving said massaging wheels back and forth along sinusoidal paths on two sides of the spinal column;

(c) reducing the pressure exerted by one of said massaging wheels on the back by moving said one massaging wheel away from the back as said one massaging wheel moves closer to the spinal column; and

(d) increasing the pressure exerted by the other one of said massaging wheels on the back by moving said other massaging wheel toward the back as said other massaging wheel moves away from the spinal column;

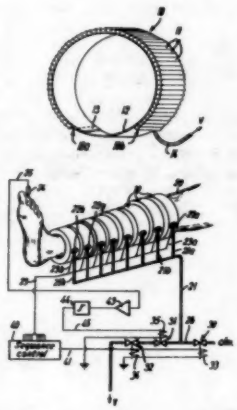
whereby, one of said massaging wheels moves toward the spinal column while the other said massaging wheel moves away from the spinal column, said massaging wheel closer to the spinal column exerting a reduced pressure on the back of the user, said massaging wheel farther from the spinal column exerting an increased pressure on the back of the user, said massaging wheels applying the same amount of pressure to the back of the user and being at the same height relative to the spinal column when said massaging wheels are equally spaced from the spinal column.

5,179,941

CONTRACTILE SLEEVE ELEMENT AND COMPRESSION SLEEVE MADE THEREFROM FOR THE PERISTALTIC TREATMENT OF EXTREMITIES

Siems O. Siemssen, 26 Hoyrups Alle, DK-2900 Hellerup, and Ole Lynnerup, Copenhagen, both of Denmark, assignors to Siems Otto Siemssen, Hellerup, Denmark

PCT No. PCT/DK89/00139, § 371 Date Feb. 7, 1991, § 102(e) Date Feb. 7, 1991, PCT Pub. No. WO89/11845, PCT Pub. Date Dec. 14, 1989
PCT Filed Jun. 6, 1989, Ser. No. 651,231
Claims priority, application Denmark, Jun. 7, 1988, 3082/88
Int. Cl.[5] A61H *1/00, 7/00*
U.S. Cl. 128—40 **8 Claims**



1. In a contractile element for use in the peristatic treatment of a patient's extremities and of the type comprising at least one sleeve means (**10**) defining at least one air evacuation chamber and adapted to be wrapped in its longitudinal direction around a patient's limb, said sleeve means (**10**) being sealed at both ends and connected with a flexible supporting strip (**12**) adapted to be wrapped around the patient's limb, the improvement comprising: said sleeve means being formed of a material that has less resistance to deformation in its longitudinal direction than in its transversal direction, and including an opening (**14**) in the wall of said sleeve providing means for air-evacuation, said sleeve longitudinally and diametrically contracting to compress a patient's limb around which it is wrapped upon evacuation of air from the sleeve air evacuation chamber.

7. A compression stocking with a control arrangement for peristaltically treating patients' extremities, comprising a number of contractile sleeve elements wherein the individual sleeve

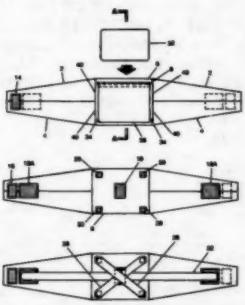
elements are provided with a respective electrically actuable magnetic valve (22*a* to 22*h*) which is open in the dormant state and wherein each individual sleeve element is in communication with a conduit (21) connected to a vacuum source (V), and wherein, in order to effect a peristaltic treatment by sequentially activating the contractile sleeve elements, there is provided a sequence control circuit (40) arranged to close a normally open magnetic valve provided between the pipe conduit (21) and atmosphere, and to substantially simultaneously open a normally closed magnetic valve (32) provided in the conduit (21) for the vacuum source (V), and subsequently to sequentially open the magnetic valves (22*g* to 22*a*) of the individual sleeve elements in the desired order for peristaltic treatment, and to re-establish atmospheric pressure, after the last one of said sleeve elements has been activated, in the individual sleeve elements simultaneously or sequentially by closing the magnetic valve (32) for the vacuum source (V) and opening the magnetic valve (30) to atmosphere.

5,179,942

LUMBAR SUPPORT THERAPEUTIC HEAT/COOLING/AIR PILLOW BELT

Dean J. Drulias, 2024 MacArthur St., Rancho Palos Verde, Calif. 90732, and Kevin P. Barry, 22 Sea Bridge, Laguna Niguel, Calif. 92677

Filed Dec. 17, 1991, Ser. No. 808,905
Int. Cl.[5] A61F *5/32*
U.S. Cl. 128—101.1 **13 Claims**



1. A lumbar support adapted for wear on the human back for support thereof and for therapeutic treatment of back pain comprising:

a primary support for positioning at the center of the lower back of a wearer and having inner and outer surfaces,

secondary support attachment means and criss-cross support attachment means on said outer surface of said primary support

elastic band means extending from opposition sides of said primary support for encircling the abdomen of a wearer, and having releasable mutually engageable end fastening means thereon and releasably engageable secondary support fastening means thereon,

a pocket mounted on said inner surface of said primary support and adapted to receive a packet removably insertable into said pocket for selectively and alternatively creating a thermal change and for providing cushioning support,

an elongated transverse secondary support disposed against said outer surface of said primary support and releasably secured thereto by said secondary support attachment means thereon and releasably secured to said elastic band means at said secondary support fastening means thereon,

a pair of small straps releasably securable relative to each other in a criss-cross orientation against said outer surface of said primary support by said criss-cross support attachment means thereon, said small straps defining therewithin at least one pouch means, and

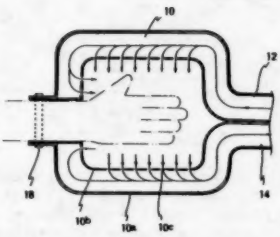
stiff stay means removably insertable into said pouch means of said small straps.

5,179,943

MEDICAL APPARATUS USING OZONE GAS

Mamoru Hama, Chino; Matao Mitsuyoshi, Chiyoda, and Takahiro Hashimoto, Shimabara, all of Japan, assignors to Kabushiki Kaisha Mihama Seisakusho, Nagano and Yugen Kaisha Aoi Shoji, Nagasaki, both of, Japan

PCT No. PCT/JP90/01369, § 371 Date Jun. 13, 1991, § 102(e) Date Jun. 13, 1991, PCT Pub. No. WO91/06275, PCT Pub. Date May 16, 1991
PCT Filed Oct. 24, 1990, Ser. No. 690,919
Claims priority, application Japan, Oct. 25, 1989, 1-277942; Oct. 25, 1989, 1-277943
Int. Cl.[5] A61H *33/00*
U.S. Cl. 128—368 **8 Claims**



1. A medical apparatus using ozone gas, comprising:

an airtight body for hermetically accommodating affected bodily parts, said airtight body having an opening through which the affected bodily parts can be inserted therein;

an ozonizer;

gas feeding means connected to the ozonizer, said feeding means being in communication with said airtight body so as to feed ozone gas thereto;

gas withdrawing means for withdrawing ozone gas from said airtight body while maintaining inner pressure thereof;

and said airtight body comprising an outer bag and an inner bag, the affected parts being insertable into the inner bag, the bags being made of plastic film, a space being formed between the bags as a path for ozone gas, the inner bag having a plurality of through-holes communicating with the path.

5,179,944

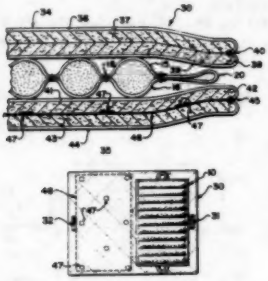
HOT/DRY, HOT/MOIST OR COLD THERAPY PAD

Laurie L. McSymytz, 148 Cardinal Crescent, Regina, Saskatchewan, Canada S4S 4Y7

Continuation-in-part of Ser. No. 643,477, Jan. 22, 1991, abandoned. This application Sep. 16, 1991, Ser. No. 760,525
Int. Cl.[5] A61F *7/00*
U.S. Cl. 128—403 **1 Claim**

1. A therapy pad comprising a substantially planar container having two sides, a filler material received within the container, the container being formed from a flexible fabric material which is resistant to heating and freezing, is permeable to moisture and retains the filler material within the container, the container being formed into a plurality of separate elongate parallel tubular compartments each extending substantially wholly across a width of the sides of the container and the compartments being arranged in a row from one end of the sides of the container to an opposed end of the container with each compartment being separated from a next to allow flexing of the container about a line between the compartments, the filler material consisting substantially wholly of sand, and a

cover for the container separate from the container and comprising a padded fabric body shaped to cover both sides of the container, the cover comprising a first side for engaging over and covering one of said sides of the container and a second side for engaging over and covering the other of said sides of the container, each of the sides of the cover having a shape and dimension substantially equal to that of the container, and the sides of the cover being connected along one common side edge such that the cover can be folded along said one common side edge, allowing the first and second sides to be opened into a flat panel and folded to an overlying condition to receive the container therebetween, the cover including fastening means



for holding the first and second sides in the folded overlying condition, the cover being formed of a first layer of fabric, a first layer of padding attached to said first layer of fabric, a second layer of fabric, a second layer of padding attached to said second layer of fabric, said first layer of fabric and said first layer of padding being attached to said second layer of fabric and said second layer of padding with the first and second layers of padding facing inwardly toward each other, said first side only of the cover having within said padded fabric body thereof between said first and second layers of padding a layer substantially coextensive with said container which is impermeable to moisture and said second side being permeable to moisture.

5,179,945

DEFIBRILLATION/CARDIOVERSION SYSTEM WITH MULTIPLE EVALUATION OF HEART CONDITION PRIOR TO SHOCK DELIVERY

Lloyd Van Hofwegen, New Brighton; Jean-Cheui Hsung, Shoreview, and Daniel Huntwork, Vadnais Heights, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Jan. 17, 1991, Ser. No. 642,337
Int. Cl.[5] A61N *1/39*
U.S. Cl. 128—419 D **27 Claims**

1. A method for defibrillating/cardioverting the heart comprising the steps of:

(a) sensing the electrical activity of the heart including the interval between successive R-waves of the ECG;

(b) comparing the interval between successive R-waves with a preset value corresponding to an interval indicative of a heart arrhythmia, to detect heart arrhythmias;

(c) charging a defibrillation capacitor to a predetermined voltage level upon detecting an arrhythmia of the heart;

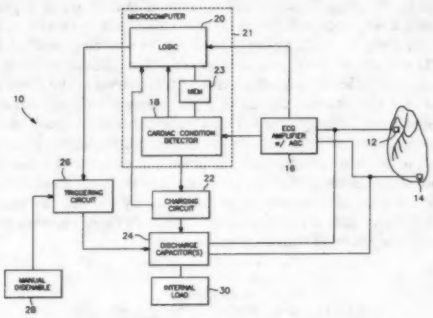
(d) storing the interval between successive R-waves during the step of charging the defibrillation capacitor;

(e) providing a first delay of a first predetermined period of time subsequent to said capacitor being charged to said predetermined level;

(f) comparing the stored interval between successive R-waves detected during the charging step with said preset value after said first delay;

(g) providing a second delay of a second predetermined period of time if said stored interval between successive R-waves is greater than said preset value as determined in step (f);

(h) comparing intervals between successive R-waves detected during the second delay with said preset value; and



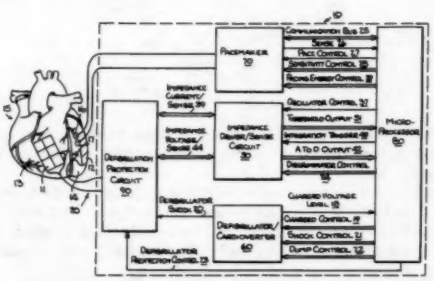
(i) discharging said defibrillation capacitor through the heart if any interval between successive R-waves detected during the second delay is less than said preset value as determined in step (h).

5,179,946

APPARATUS AND METHOD FOR ARRHYTHMIA DETECTION BY VARIATIONS IN THE TRANSCARDIAC IMPEDANCE BETWEEN DEFIBRILLATION PATCHES

Steven M. Weiss, West Plymble, Australia, assignor to Telectronics Pacing Systems, Inc., Englewood, Colo.

Filed Nov. 26, 1990, Ser. No. 617,987
Claims priority, application Australia, Dec. 28, 1989, PJ 8038
Int. Cl.[5] A61N *1/39, 1/368*
U.S. Cl. 128—419 D **32 Claims**



1. Apparatus for measuring the haemodynamic condition of a patient's heart, comprising:

at least two cardioversion/defibrillation electrodes adapted to be positioned on the outer surface of the ventricles of the patient's heart generally across the short axis of said ventricles whereby at least the major portion of one of said electrodes is positioned on the left ventricular free wall;

means coupled to said electrodes for sensing normal variations in the transcardiac impedance between said electrodes and determining the magnitude thereof;

means for determining changes in the magnitude of the pulsations of said normal variations of said transcardiac impedance; and

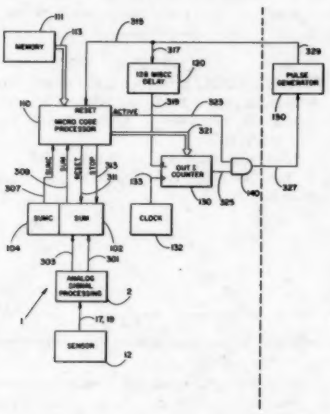
means responsive to said pulsation magnitude changes in normal variations of said transcardiac impedance for providing signals indicative of changes in the haemodynamic condition of the patient's heart.

5,179,947

ACCELERATION-SENSITIVE CARDIAC PACEMAKER AND METHOD OF OPERATION

Scott C. Meyerson, Mounds View; William J. Linder, Golden Valley, and Keith R. Maile, New Brighton, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Jan. 15, 1991, Ser. No. 641,549
Int. Cl.[5] A61N *1/365*
U.S. Cl. 128—419 PG **13 Claims**



1. A rate adaptive pacemaker comprising:

means for sensing a physiological parameter wherein the sensing means provides an output signal corresponding to the sensed physiological parameter;

means for providing a sensor determined interval from the output signal coupled to the sensing means and comprising means for performing analog signal processing and means for performing digital signal processing;

means for determining an actual pacing interval;

means for determining a pacing rate coupled to the means for providing the sensor determined interval and the means for determining the actual pacing interval wherein the pacing rate is a function of both the sensor determined interval and the actual pacing interval;

means for generating pacing pulses at said pacing rate; and

wherein the means for performing analog signal processing compromises:

(a) means connected to receive the output signal for chopping and modulating the output signal and providing a first modulated signal;

(b) first means for amplifying coupled to the chopping and modulating means to receive the first modulated signal and provide a first amplified output;

(c) first means for filtering having a first input coupled to receive the first amplified output and providing a first filtered output;

(d) second means for amplifying coupled to the first filtered output and providing a second amplified output;

(e) demodulator means for demodulating having an input coupled to the second amplified output and providing a demodulated output;

(f) second means for filtering having an input coupled to the demodulated output and providing a second filtered output;

(g) third means for amplifying having a first input also coupled to the second filtered output and providing a third amplified output; and

(h) means for converting analog signals to digital signals having first and second inputs coupled to the third amplified output.

5,179,948

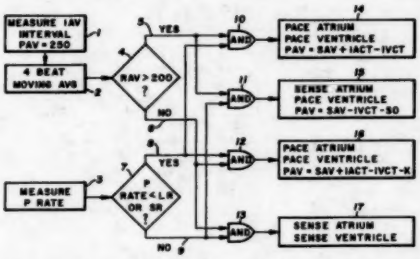
Patent Not Issued For This Number

5,179,949

CARDIAC PACEMAKER WITH AUTOMATIC A-V PROGRAMMING FOR OPTIMIZATION OF LEFT HEART A-V INTERVAL

Raul Chirife, Pirovano 137, 1650 Martinez, Buenos Aires, Argentina

Filed Dec. 7, 1990, Ser. No. 624,047
Int. Cl.[5] A61N *1/368*
U.S. Cl. 128—419 PG **9 Claims**



1. In a cardiac pacemaker of the type including a means for sensing atrial depolarization signals, means for sensing ventricular depolarization signals, control means for receiving said atrial and ventricular depolarization signals, atrial and ventricular pacing means for applying stimulating pulses to the atrium and to the ventricle, said pacemaker further including an improved timing means in said control means comprising:

(a) means coupled to said atrial sensing means for determining whether the rate at which said atrial depolarization signals occur are below a first predetermined value;

(b) AV interval determining mean coupled to said atrial and said ventricular sensing means for determining whether the time between the occurrence of an atrial depolarization signal and the next succeeding ventricular depolarization signal, on the average, exceeds a predetermined AV interval value and if so, triggering said ventricle pacing means to generate a series of ventricular stimulating pulses, each ventricular pulse following a predetermined time delay from the preceding atrial depolarization signal; and

(c) means for adjusting pacing induced AV interval and for producing an effective left heart AV interval corrected for pacing-induced timing delays which result from whether the artrium and/or ventricles are being paced or sensed.

5,179,950

IMPLANTED APPARATUS HAVING MICRO PROCESSOR CONTROLLED CURRENT AND VOLTAGE SOURCES WITH REDUCED VOLTAGE LEVELS WHEN NOT PROVIDING STIMULATION

Henry Stanislaw, Blairstown, N.J., assignor to Cyberonics, Inc., Webster, Tex.

Division of Ser. No. 434,985, Nov. 13, 1989. This application Dec. 5, 1991, Ser. No. 802,740
Int. Cl.[5] A61N *1/36*
U.S. Cl. 128—423 R **1 Claim**

1. An implanted apparatus for providing an electrical signal to a living organism, comprising:

a battery for providing electrical energy;

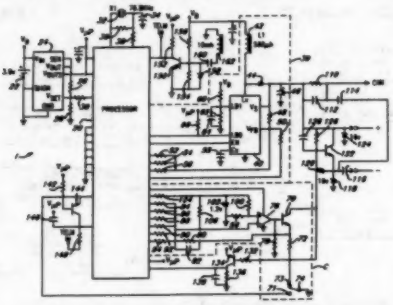
a power supply circuit connected to said battery and having a voltage output responsive to a signal to select between two voltage output levels;

a microprocessor having its power input connected to said power supply voltage output and having a plurality of

inputs and outputs, one of said outputs connected to provide a signal to select said power supply voltage output level;

a current source for providing the electrical signal to the living organism, said current source being coupled to said outputs of said microprocessor to control the production and level of the signal provided by said current source;

a voltage source connected to said current source and to said battery to provide operating energy for said output signal, said voltage source being coupled to said microprocessor outputs to control the production and level of the voltage provided by said voltage source; and



means for directing said microprocessor to set output levels to select the lower power supply output voltage level and to disable production of signals by said current source and said voltage source when the electrical signal is not being provided to the living organism and for directing said microprocessor to set output levels to select the higher power supply output voltage level and to enable production of signals by said current source and said voltage source when the electrical signal is being provided to the living organism.

5,179,951

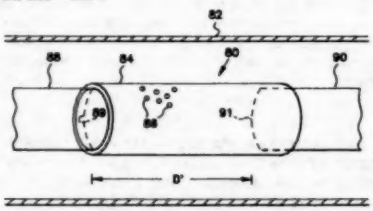
BLOOD CONSTITUENT MEASUREMENT

Mark B. Knudson, Arden Hills, Minn., assignor to Inomet, Inc., Arden Hills, Minn.

Division of Ser. No. 510,935, Apr. 19, 1990, Pat. No. 5,115,133. This application Dec. 20, 1991, Ser. No. 812,565

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—633 **4 Claims**



1. An apparatus for determining a level of a constituent in a body fluid, said apparatus comprising:

a first light transmitting member;

a second light transmitting member;

separation means for separating said first and second members by a separation distance with said first light transmitting member disposed to direct light to said second light transmitting member;

light generating means for generating a testing light of known intensity with said testing light including a wavelength absorbable by said constituent and directing said testing light to said first light transmitting member, said light generating means further including means for generating the reference light of known intensity and having a wavelength nonabsorbable by said constituent;

light detecting means for measuring an intensity of said testing light and said reference light in said second transmitting member;

light path measurement means for measuring a distance between said first and second light transmitting members;

circuit means for calculating a level of said constituent in a fluid between said first and second transmitting members in response to a reduction in intensities of said testing light and said reference light and in response to said distance measured by said light path measurement means.

5,179,952

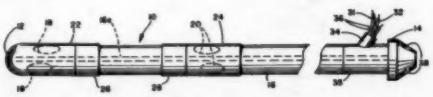
ELECTROCARDIAL STIMULATOR PROBE

Rimas P. Buinevicius, Palos Park, and William Metzger, Libertyville, both of Ill., assignors to Arzco Medical Electronics Inc., Vernon Hills, Ill.

Filed Aug. 13, 1990, Ser. No. 566,745

Int. Cl.[5] A61B *5/0402;* **A61N** *1/05*

U.S. Cl. 128—642 **15 Claims**



1. An electrocardial probe insertable into an esophagus of a body with the esophagus located adjacent to a cardiac organ, the probe comprising:

a tubular, flexible, hollow conduit with an exterior surface, a proximal end and a distal end, said distal end and said conduit are sized and shaped for insertion, at least in part, into the esophagus with said conduit defining an axially extending interior lumen to communicate cardiac sounds from inside the body to said proximal end, said lumen and said exterior surface bounding a conduit wall;

means, at said proximal end, for communicating sounds inside said hollow conduit to an external listening device;

at least one electrode carried on said exterior surface usable for one of cardiac monitoring or stimulation;

a conductor coupled to and extending between said electrode and said proximal end;

means, at said proximal end, for connecting said conductor to an external source of electrical energy for use in one of cardiac monitoring or stimulation;

at least two sets of sound transmissive openings formed in said conduit wall, said sets of openings are spaced apart longitudinally along said conduit with said electrode positioned therebetween, first and second openings of each said set are symmetrically spaced radially on said conduit surface wherein said openings are longitudinally positionable along the esophagus adjacent to the cardiac organ to receive cardiac sounds and wherein said electrode thereby is located between said sets so as to be usable for atrial-type cardiac stimulation.

5,179,953

PORTABLE DIURNAL INTRAOCULAR PRESSURE RECORDING SYSTEM

Gerald H. Kursar, Des Peres, Mo., assignor to Jermik Systems, Ltd., St. Louis, Mo.

Filed Aug. 27, 1991, Ser. No. 750,528

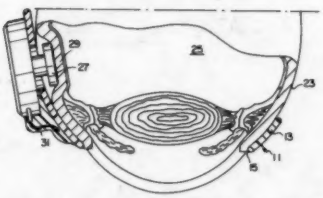
Int. Cl.[5] A61B *3/16*

U.S. Cl. 128—645 **4 Claims**

1. A device for continuously monitoring the intraocular pressure in an eye, comprising:

a scleral contact lens having a pressure transducer thereon for measuring intraocular pressure and sized to fit within the sclera of an eye and position said pressure transducer

in fixed contact with said sclera to indent said sclera in the superior temporal quadrant of the eye in the superior cul-de-sac during movement of said eye, said pressure transducer including at least one semiconductor strain gauge crystal adapted to vary its electrical resistance in response to intraocular pressure and projection means for positive scleral indentation, said projection means being



positioned to transmit a response to intraocular pressure to said crystal;

battery powered memory means mounted in said lens in non-scleral contact for recording measurements of the resistance through said crystal; and

output means for providing access to said measurements upon removal of said lens from the eye.

5,179,954

ULTRASONIC INSPECTION AND IMAGING INSTRUMENT

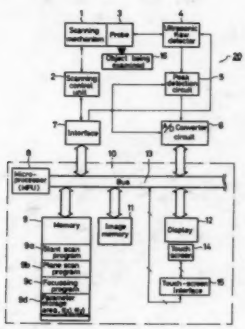
Yukio Arima, Tsukuba; Hiroaki Yanagimoto, Ibaraki; Yuichi Kunitomo, Tsuchiura, and Tetsuyoshi Tominaga, Ibaraki, all of Japan, assignors to Hitachi Construction Machinery Company, Ltd., Tokyo, Japan

Filed May 30, 1991, Ser. No. 707,567

Claims priority, application Japan, May 30, 1990, 2-141016

Int. Cl.[5] A61B *8/00*

U.S. Cl. 128—660.07 **17 Claims**



1. An ultrasonic inspection and imaging instrument for scanning an object under examination, said object having an interior test surface for detecting an echo level emanating from a position corresponding to a focal position obtained from said object under examination by means of a focusing-type probe and for making the echo level a measured value, and for generating display data according to said measured value in order to display a measurement picture of said test surface on the screen of a display, said instrument comprising:

scanning means for scanning said object under examination in a first direction along said test surface and in a second direction along the depth direction of said object under examination; and

image processor means for carrying out, by controlling said scanning means, slant scanning in the second direction during the scanning in the first direction, for generating said display data according to the measured value obtained in order to display a measurement picture on the screen of said display, and for placing said probe at a position in the second direction where the measured value is collected with respect to an image portion in response to an input signal when the input signal is externally supplied, the input signal indicating that said image portion has been selected from said measurement picture.

5,179,955

METHOD OF ABDOMINAL ULTRASOUND IMAGING

Harold B. Levene, San Diego; James L. Barnhart, Encinitas, and Kenneth J. Widder, Del Mar, all of Calif., assignors to Molecular Biosystems, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 660,349, Feb. 22, 1991. This application May 28, 1991, Ser. No. 706,323

The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.

Int. Cl.[5] A61B *8/00*

U.S. Cl. 128—662.02 **14 Claims**

1. In a method of abdominal ultrasound imaging, the steps comprising: introducing an aqueous dispersion of hydrous edible clay particles into a portion of the gastrointestinal (GI) tract associated with the abdominal region to be examined, said clay particles being sized below 10 microns and said dispersion containing from 0.1 to 10 grams of the particles per 100 milliliters of water together with a sufficient amount of a solubilized hydrocolloid to maintain the particles in suspension during said introduction; and, after said dispersion has coated the GI tract walls in said region, applying an ultrasonic imaging beam to said region to delineate said walls and structures outside thereof.

5,179,956

CONTACT PRESSURE SENSOR

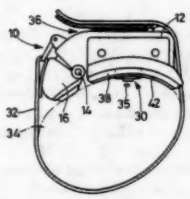
Chikao Harada; Norio Kawamura, both of Nagoya; Ryuji Nakashima, Seto; Arihiro Takahashi, Komaki; Toshimasa Yamazaki, Komaki; Masanobu Yasui, Komaki, and Tatsushi Kondo, Urawa, all of Japan, assignors to Colin Electronics Co., Ltd., Aichi, Japan

Filed Jun. 26, 1991, Ser. No. 721,317

Claims priority, application Japan, Jul. 6, 1990, 2-180259; Aug. 22, 1990, 2-221642

Int. Cl.[5] A61B *5/021*

U.S. Cl. 128—672 **23 Claims**



1. A contact pressure sensor comprising:

a semiconductor having opposite surfaces;

at least one pressure sensing element provided in one of said opposite surfaces of said chip;

a spacer member supporting the other surface of said chip, said spacer member having a side surface substantially flush with an edge of said chip;

a substrate having a surface to which said spacer member is fixed;

said one surface of said chip being adapted to be pressed against an object which produces a pressure, so that said at least one sensing element detects said pressure produced by said object;

a first connection terminal provided in said one surface of said chip adapted to be pressed against said object;

a second connection terminal provided in a free portion of said surface of said substrate which portion is free from said spacer member; and

a flexible flat cable connecting between said first and second connection terminals, said flexible flat cable being bent into two portions one of which extends along said side surface of said spacer member and the other of which extends along said free portion of said surface of said substrate.

5,179,957

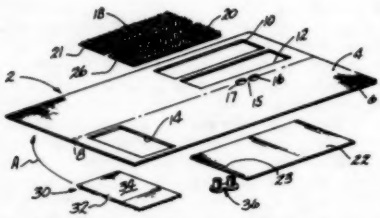
BLOOD PRESSURE CUFF AND HOSE FITTING THEREFOR

Michael Williams, Coventry, Conn., assignor to CAS Medical Systems, Inc., Branford, Conn.

Filed Dec. 11, 1990, Ser. No. 625,816

Int. Cl.[5] A61B *5/022*

U.S. Cl. 128—686 **4 Claims**



1. An inflatable blood pressure cuff formed from a woven fabric sheet having one surface thereof coated with a fusable polymer to render the fabric impermeable to air, said coated surface forming the interior of the cuff, and said sheet being folded about a medial fold line to bring said coated surface into contact with itself, said cuff including an inflatable chamber bounded by said medial fold line and by edges of said coated surface which are fused together; and a one piece molded air hose fitting formed from said fusable polymer, said fitting comprising a pair of adjacent tubular hose connections, and a basal flange completely surrounding both of said hose connections, said flange being fused to said said polymer coating in said inflatable chamber, with said hose connections projecting through adjacent openings in said sheet to access said chamber to external inflation/deflation and pulse sensing hoses.

5,179,958

RESPIRATORY CALORIMETER WITH BIDIRECTIONAL FLOW MONITOR

James R. Mault, 4227 Pin Oak Dr., Durham, N.C. 27707

Continuation-in-part of Ser. No. 368,947, Jun. 23, 1989, Pat. No. 5,038,792, which is a continuation-in-part of Ser. No. 213,184, Jun. 29, 1988, Pat. No. 4,917,708. This application Jul. 8, 1991, Ser. No. 726,922

The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.

Int. Cl.[5] A61B *5/08*

U.S. Cl. 128—718 **6 Claims**

1. An indirect calorimeter operative to measure the respiratory oxygen consumption per unit time of a subject comprising:

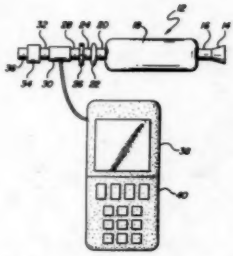
a respiratory connector operative to be supported in contact with the subject so as to pass inhaled and exhaled gases as the subject breathes;

means for connecting to a source of respiratory gases;

a pass-through bidirectional flow meter adapted to generate electrical signals as a function of the volume of gases which pass through it in either direction;

a pass-through carbon dioxide scrubber operative to absorb carbon dioxide from gases which pass through it;

conduits interconnecting said respiratory connector, said means for connecting to a source of respiratory gases, said scrubber and said flow meter so that upon inhalation by the patient gases are passed from the source of respiratory gases, through the flow meter, to the subject through the respiratory connector and upon exhalation by the subject the exhaled gases are passed first through the scrubber,



then through the flow meter in a direction opposite to the inhaled gases; and

means for receiving the generated electrical signal from the flow meter and for generating a signal proportional to the integral of the difference between the inhaled and exhaled gas volumes over a period of time.

5,179,959

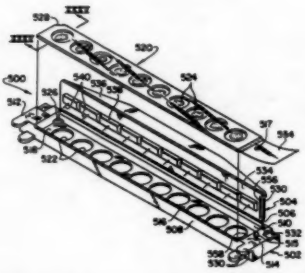
ALLERGY TESTING APPARATUS AND METHOD

Henry Fishman, Washington, D.C.; Robert Olshaker, San Diego, Calif., and Gary Johnson, New York, N.Y., assignors to Henry Fishman, Washington, D.C.

Continuation of Ser. No. 626,236, Dec. 11, 1990, Pat. No. 5,076,282, which is a continuation of Ser. No. 532,239, May 29, 1990, abandoned, which is a continuation of Ser. No. 113,364, Oct. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 853,748, Apr. 18, 1986, abandoned. This application Oct. 29, 1991, Ser. No. 780,128

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—743 **6 Claims**



1. An allergy testing apparatus and an allergen source strip for use in said allergy testing apparatus, said allergy testing apparatus including means for removably receiving an allergen source testing strip, said allergen source testing strip comprising:

a carrier member having a predetermined plurality of allergen sources thereon at spaced apart positions;

means for sealingly enclosing said allergen sources in said carrier member; and

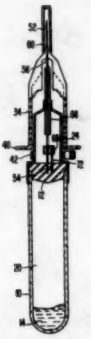
orientation means cooperatively coupling with a corresponding orientation means in said allergy testing apparatus for permitting receiving of said allergen source testing strip in said allergy testing apparatus in only a single given orientation.

5,179,960

BIOLOGICAL FLUID COLLECTION AND DELIVERY APPARATUS AND METHOD

Robert J. Sarrine, Beaumont, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.

Filed Aug. 16, 1991, Ser. No. 746,412
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—764 10 Claims



1. Apparatus for drawing biological fluid from a patient into a test tube, the test tube being sealed with a puncturable closure, and for thereafter dispensing the biological fluid through the closure and from the test tube comprising:

a flexible member adapted to be attached to said test tube;

a removable cover on said flexible member;

a cannula having a first portion extending through said cover and a second portion extending along said flexible member;

said cannula second portion having a tip insertable through said closure;

said cannula first portion having a tip extending through said cover for withdrawal of biological fluid from a patient, such that said biological fluid flows through said cannula into said sealed test tube; and

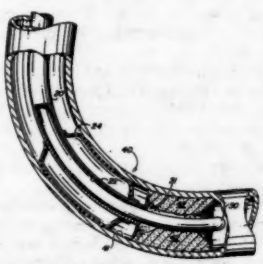
said cover being removable from said flexible member such that upon flexing said flexible member, biological fluid flows from said sealed test tube through said cannula.

5,179,961

CATHETER GUIDING AND POSITIONING METHOD

Philip O. Littleford, deceased, late of Winter Park, Fla., and by H. Richard Bates, personal representative, 322 E. Central Blvd., Orlando, Fla. 32801

Division of Ser. No. 337,475, Apr. 13, 1989, Pat. No. 5,054,500. This application Oct. 2, 1991, Ser. No. 769,969
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—772 6 Claims



1. A method for aligning a treatment catheter used in treating an arterial blockage in an artery of a patient comprising the steps of:

providing a guiding catheter having a distal end dimensioned for extension into the artery of the patient, the guiding catheter having a longitudinal lumen extending through the guiding catheter and through its distal extremity, the guiding catheter further comprising means for aligning the distal end within the artery and means for operating the aligning means;

extending the distal end of the guiding catheter into the artery and adjacent to, and short of the arterial blockage;

operating the aligning means to align the distal extremity of the longitudinal lumen with the arterial blockage;

guiding the treatment catheter through the longitudinal lumen and its distal extremity and then to the arterial blockage; and thereafter

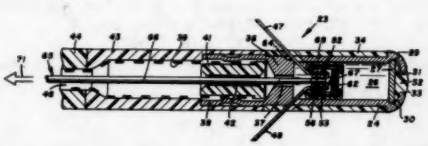
treating the arterial blockage with the treatment catheter.

5,179,962

CARDIAC LEAD WITH RETRACTIBLE FIXATORS

Robert G. Dutcher, Minneapolis; Brian M. Packard, Monticello, and Robert J. Scott, Minneapolis, all of Minn., assignors to Possis Medical, Inc., Minneapolis, Minn.

Filed Jun. 20, 1991, Ser. No. 718,377
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—785 37 Claims



1. An implantable lead comprising: an electrical conductor having a first end adapted to be connected to a cardiac arrhythmia management device and a second end, a sheath of insulative material covering said conductor, and an electrode and fixation assembly connected to the second end of the conductor and the sheath, said electrode and fixation assembly including a body having a chamber, said body being an electrical conductor member connected to the electrical conductor, said body having a distal end including and outer surface for directly containing the endocardium of the heart, a jacket of electrical insulation material covering the body except for said outer surface, carrier means located within the chamber for movement between first and second positions; at least one fixation means moveable from a first position within the assembly to a second position extended away from the assembly for engagement with the endocardium of the human heart, means mounting said fixation means on the carrier means whereby the fixation means moves with the carrier means, said body and jacket having hole means open to the chamber accommodating the fixation means to allow the fixation means to be moved from the chamber outwardly of the body into the endocardium of the heart and moved inwardly into the body out of engagement with the endocardium of the heart, said carrier means cooperating with means operable to selectively move the carrier means to the first and second positions to extend and retract the fixation means relative to the body.

5,179,963

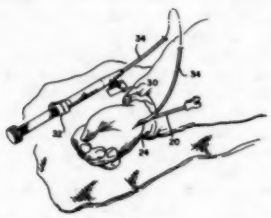
PERCUTANEOUS CARPAL TUNNEL PLASTY METHOD

J. Lee Berger, 895 Mohawk Rd., Franklin Lakes, N.J. 07417

Filed Oct. 11, 1991, Ser. No. 774,869
Int. Cl.[5] A61B *17/00*
U.S. Cl. 128—898 9 Claims

1. A surgical procedure for relieving nerve entrapment syndrome by increasing the spatial diameter of the carpal tunnel enclosing the nerve comprising making an incision

through the skin subcutaneous tissue proximate the .entrapped nerve, retracting the incision, inserting a director means for protecting the nerve and underlying structure into said incision, inserting a deflated balloon catheter by means of said director means through said incision into said tunnel along



with means for monitoring pressure in said tunnel, serially inflating and deflating said balloon catheter while intermittently moving it along the tunnel and continuously montioring the pressure therein to thereby increase the diameter of the tunnel, deflating and removing said catheter, and director means from said incision and closing the incision.

5,179,964

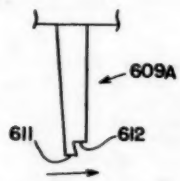
SURGICAL STAPLING METHOD

Melvin S. Cook, 8 Saddle Ridge Rd., Ho-ho-Kus, N.J. 07423

Filed Aug. 30, 1991, Ser. No. 753,116

Int. Cl.[5] A61B *17/00*

U.S. Cl. 128—898 **9 Claims**



1. A method of closing an incision comprising the steps of:
inserting a plurality of staples into tissue on each side of an incision location;
joining predetermined staples from a first side of said incision location to predetermined staples on a second side of said incision location to thereby close said incision there being a distance between joined staples; and
varying the distance between joined staples in a continuous manner.

5,179,965

APPARATUS FOR FORMING MICRO-HOLES ON CYLINDRICAL OBJECTS

Mikio Komori; Kazuyu Adachi, and Shuichi Sato, all of Tokyo, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

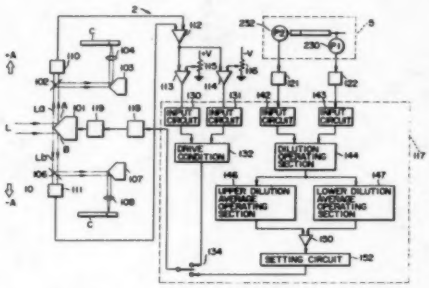
Filed Dec. 7, 1990, Ser. No. 624,316

Claims priority, application Japan, Dec. 8, 1989, 1-317562

Int. Cl.[5] A24C *5/00*; A24B *7/14*

U.S. Cl. 131—281 **41 Claims**

1. An apparatus for forming micro-holes on cylindrical objects comprising:
means for generating an input laser beam;
means for dividing the input laser beam into first and second laser beams;
means for moving the dividing means to change the ratio at which the laser beam is divided into the first and the second laser beams;
first and second detector means for detecting portions of the first and the second laser beams, respectively to generate first and second electric signals;
first and second converging means for subdividing the remaining portions of the first and the second laser beams and for converging the subdivided first and second beams onto corresponding cylindrical objects;
first and secnd means for rotating the cylindrical objects around axes thereof, while holding the cylindrical objects



to enable micro-holes to be formed on the outer circumference of the rotating cylindrical objects by the first and second laser beams; and
processing means for processing the first and the second signals to generate a drive signal and driving the moving means responsive to the drive signal to move the dividing means to a position where the first and the second laser beams are of substantial equal intensity.

5,179,966

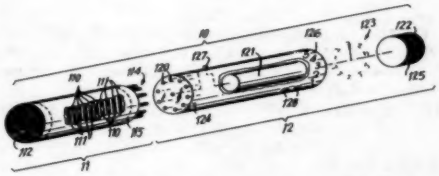
FLAVOR GENERATING ARTICLE

D. Bruce Losee, Richmond; Constance H. Morgan, Midlothian; F. Murphy Sprinkel, Glen Allen, and Francis V. Utsch, Midlothian, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation of Ser. No. 615,590, Nov. 19, 1990, Pat. No. 5,095,921. This application Dec. 17, 1991, Ser. No. 808,640

Int. Cl.[5] A61M *16/00*

U.S. Cl. 131—351 **85 Claims**



1. An article for delivering to a consumer an inhalable flavor-containing substance, said article comprising:
a plurality of pre-measured charges of flavor generating medium;
electrical heating means for communicating heat sufficient for combustion to each of said plurality of charges individually, said electrical heating means including a plurality of individual electrical heating elements, one for each of said plurality of charges;
a source of electrical energy for powering said electrical heating means; and
control means for selectively applying said electrical energy to said plurality of electrical heating elements to selectively heat said plurality of charges in a predetermined sequence to combustion, each of said charges being heated only once and, when combusted, delivering a quantity of

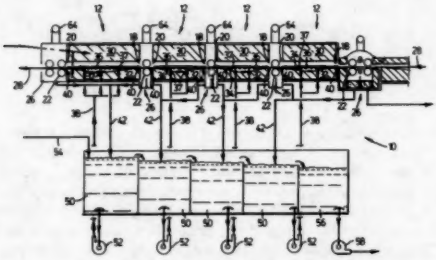
flavor-containing substance to said consumer, said heating means and said charges being constructed and arranged so that activation of said control means heats to combustion only said at least one but less than all of said plurality of charges.

5,179,967

APPARATUS FOR RINSING METAL STRIP

Albert S. Mattiussi, Burlington, Canada, assignor to Nelson Steel, Stoney Creek, Canada

Filed Aug. 28, 1991, Ser. No. 751,394
Int. Cl.[5] B08B *3/08*
U.S. Cl. 134—60 **12 Claims**



1. An apparatus for rinsing metal strip, said apparatus comprising:

at least two adjacent rinse tanks, each rinse tank having an inlet end, an outlet end, a bottom and sides, said bottom having an upper surface which slopes upwardly toward each of said inlet end and outlet end, to define a respective weir at each of said inlet and outlet ends, said bottom further having rinse fluid ports for discharging rinse fluid onto said upper surface;

rinse fluid supply means for supplying rinse fluid to said rinse fluid ports; and

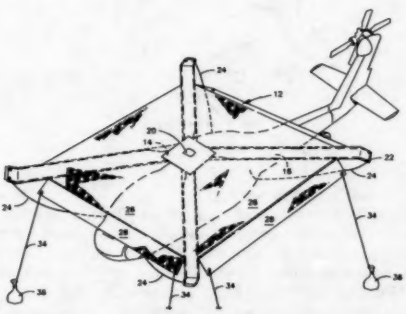
control means located between said two adjacent tanks for controlling and maintaining the level of said rinse fluid above said strip within each tank and between said adjacent tanks, so that said strip is submerged in each tank and between said adjacent tanks.

5,179,968

CLIMATIC HEAT AIRCRAFT PROTECTIVE SCREEN

Richard E. Deichmann, Milford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 16, 1990, Ser. No. 614,774
Int. Cl.[5] E04H *15/06*
U.S. Cl. 135—88 **15 Claims**



1. A climatic heat aircraft protective screen for protecting a helicopter having a predetermined number of main rotor blades from direct sunlight, said protective screen being configured for ready and rapid deployment by a minimum number of personnel in minimum time, comprising:

porous screen canopy means for shielding an aircraft from direct sunlight in a deployed condition, said porous screen canopy means having a configuration that is operative in the deployed condition to reflect sunlight therefrom, said configuration of said porous screen canopy being further operative to allow air to pass therethrough wherein said climatic heat aircraft protective screen is stable in the deployed condition to wind conditions;

securing means attached to said porous screen canopy means for securing said porous screen canopy means in the deployed condition, said securing means including a plurality of radial deployment strips attached to said porous screen canopy means for facilitating deployment of said porous screen canopy means, said plurality of radial deployment strips corresponding in number and attachment orientation to the predetermined number of main rotor blades; and

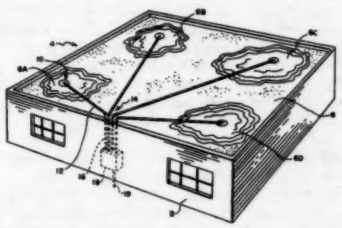
containment bag means integrally attached to said porous screen canopy means for storing said porous screen canopy means and said securing means in a compact configuration prior to deployment.

5,179,969

METHOD AND APPARATUS FOR FREE-STANDING WATER REMOVAL FROM ROOF AND SIPHON HEAD THEREFOR

David T. Peterson, Roberts Rd., Barrington, Ill. 60010

Division of Ser. No. 553,525, Jul. 17, 1990, Pat. No. 5,063,959.
This application Feb. 11, 1991, Ser. No. 653,683
Int. Cl.[5] F04F *10/00*
U.S. Cl. 137—1 **16 Claims**



1. For use with a substantially flat horizontal roof having a pressurized city-type water line, the improvement of a roof draining system for draining away water that accumulates on the roof, a series of portable siphon heads which can be placed anywhere on the roof where there is a ponding area that no longer can be drained by any pre-existing water drainage system, the roof draining system including a series of upstanding pipes, a second series of roof top pipes each connected at one end to one of said siphon heads and each connected at an opposite end to one of said upstanding pipes, a control valve structure, the upstanding pipes connected to the control valve structure, the control valve structure involving a series of solenoid operated valves each connected to one of said upstanding pipes at one end, pipe means connected to each of said solenoid operated valves at one end, said pipe means being connectable with the pressurized city type water line, pipe tees each connected at one end to an associated one of said solenoid operated valves, manual discharge valves each connected at an opposite end of one of said pipe tees, an electrical timer operatively connected to each of said solenoid operated valves, siphon pumps each positioned in line with and operatively connected between one of said solenoid operated valves and the associated pipe tee, the timer being cooperable with sole-

noid operated valves at timed intervals to cause the solenoid operated valves to open thus permitting city water to pass through the solenoid operated valves and the associated siphon pump, the siphon pumps, each having a Venturi jet passageway therein which functions to generate a pressure differential in a region of said pipe tee causing roof water to be siphoned from the ponding areas on the roof into the associated upstanding pipe and then through a discharge valve inlet which flow continues from the roof ponds until the roof ponds are drained dry, said timer being operable at predetermined intervals to automatically shut off said solenoid operated valves after the interval expires.

5,179,970

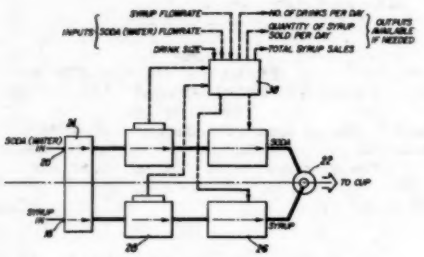
BEVERAGE DISPENSING VALVE

George J. Jarocki, Atlanta, Ga., and Tadeusz M. Drzewiecki, Rockville, Md., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 112,906, Oct. 23, 1987, abandoned. This application Oct. 10, 1989, Ser. No. 419,290

Int. Cl.[5] G05D *11/13*

U.S. Cl. 137—9 **6 Claims**



1. A postmix beverage dispenser valve comprising:

(a) a body having a syrup conduit and a water conduit therethrough for carrying syrup and water, respectively, from respective inlet ports to a mixing nozzle;

(b) a fluidic oscillator flowmeter in at least one of said conduits for measuring the flow therethrough and including a sensor for generating electrical signals corresponding to the said flow;

(c) a controller connected to said sensor for receiving signals therefrom and for generating control signals;

(d) flow control means in said at least one conduit downstream from said flowmeter and connected to said controller for receiving said control signals and for controlling the flow through said flow control means; and

(e) said film transducer including two outer metal layers and an electrode connected to each of said metal layers.

5,179,971

SIDEWALL SUPPORT FOR DUAL CONTAINMENT VESSELS

Melvin D. Jackson, 7220 201st NE., Arlington, Wash. 98223

Filed Apr. 1, 1992, Ser. No. 862,601

Int. Cl.[5] B65D *25/00*

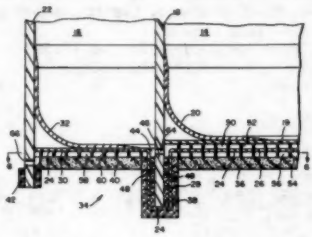
U.S. Cl. 137—264 **20 Claims**

1. A dual containment vessel for potentially environmentally hazardous fluid containing compounds comprising:

a foundation system having an inner foundation portion, a primary recessed foundation portion spaced radially outwardly therefrom, and an outer foundation portion spaced radially outwardly therefrom, said inner foundation portion substantially supporting first secondary floor portion, said primary recessed foundation portion substantially supporting a recessed secondary floor portion, and said outer foundation portion substantially supporting a second secondary floor portion;

a secondary floor system having said first secondary floor portion, recessed secondary floor portion, and second secondary floor portion forming a fluid impermeable secondary floor membrane;

a vertically oriented primary sidewall and a generally horizontal primary floor, said primary recessed foundation portion supporting said primary sidewall, said first secondary floor portion supporting said primary floor, and



said primary sidewall and primary floor being sealingly interconnected to form a fluid impermeable primary tank;

a vertically oriented secondary sidewall and a generally horizontal secondary floor system, said secondary floor system and secondary sidewall being sealingly interconnected to form a fluid impermeable secondary tank; and

means for rigidly supporting the primary sidewall in a recess created by the recessed secondary floor portion.

5,179,972

HOSE REEL

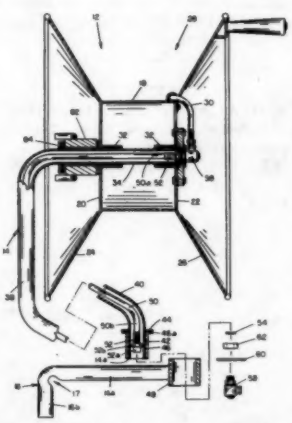
John H. Eley, Box B, Orchard, Nebr. 68764

Continuation-in-part of Ser. No. 659,516, Feb. 21, 1991. This application Feb. 13, 1992, Ser. No. 835,622

The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.

Int. Cl.[5] B65H *75/34*

U.S. Cl. 137—355.19 **2 Claims**



1. A hose reel, comprising:

a reel member rotatably mounted on a horizontal tube;

said reel member including a generally cylindrical hub portion coaxial with said horizontal tube, and a pair of opposing flanges projecting radially outwardly from said hub to form an annular channel for receiving a hose;

said horizontal tube extending completely through said hub and having first and second ends projecting from opposing sides of said hub;

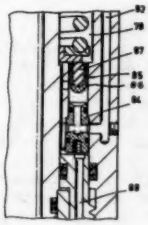
said horizontal tube first end projecting freely from said hub;
an upstanding tube depending from said second end of said horizontal tube and bent so as to have a lower vertical portion aligned generally vertically under the center of said reel member;
the lower vertical portion of said upstanding tube being rotatably mounted to a first end of a generally horizontal support arm, with the rotational axis of said upstanding tube oriented vertically under the general center of said reel member;
said support arm having a short depending arm at a second end thereof adapted for receipt within a tubular support;
said support arm having a length between the first and second ends to permit full rotation of said reel member and upstanding tube on said rotational axis.

5,179,973

VALVE WITH PRESSURE ASSISTED CLOSING SYSTEM

Rennie L. Dickson, Carrollton; Craig W. Godfrey, Richardson; Kenneth L. Schwendemann, Lewisville, and Timothy J. Noack, Grapevine, all of Tex., assignors to Otis Engineering Corp., Dallas, Tex.

Division of Ser. No. 310,697, Feb. 15, 1989, Pat. No. 5,050,839. This application Jun. 20, 1991, Ser. No. 718,568
Int. Cl.[5] F16K *31/22, 31/122*
U.S. Cl. 137—433 **9 Claims**



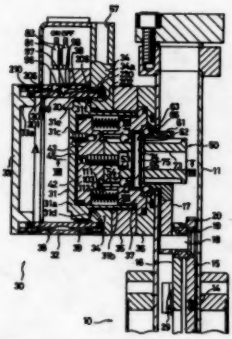
1. A valve comprising:
a body having a flowway therethrough;
a valve seat and cooperable valve member controlling flow through said passageway; and
means for moving said valve member between open and closed positions comprising:
a chamber having a piston slidable therein,
said chamber above said piston providing a control chamber having a port for receiving control fluid,
said chamber below said piston providing a dome chamber,
said piston sealing between said control and dome chambers
a port opening into the bottom of said dome chamber,
a charge of gas in said dome chamber, and
a float valve and seat positioned in the bottom of said dome chamber and controlling said dome chamber port, whereby said gas may be introduced through said port driving any liquid in said port into said dome chamber to increase the pressure therein and said gas will be trapped in said dome chamber when said liquid in said dome chamber drops to a predetermined level and permitting said float valve to seat against said float valve seat to assist in closing said valve member.

5,179,974

VALVE OPEN-CLOSE INDICATING APPARATUS

Tsutomu Taniguchi, Yokohama, Japan, assignor to Fuji Seiki Inc., Kanagawa, Japan

Filed Aug. 5, 1992, Ser. No. 926,529
Claims priority, application Japan, Aug. 6, 1991, 3-196866
Int. Cl.[5] F16K *37/00*
U.S. Cl. 137—554 **4 Claims**



1. A valve open-close indicating apparatus for indicating an open or closed state of a valve, comprising:
a cylindrical housing having two opposite ends in the axial direction thereof;
a sleeve arranged in the housing for axial reciprocation between the opposite ends of the housing;
urging means for urging the sleeve from both outer sides with respect to the axial direction so that the sleeve is normally situated in an intermediate position between the opposite ends;
a piston arranged in the sleeve for axial reciprocation between the opposite ends of the housing, said piston being adapted to reciprocate between the opposite ends of the housing, thereby opening and closing the valve, so that the sleeve is pressed toward one end of the housing against the urging force of the urging means when the piston moves toward the one end to open the valve, and that the sleeve is pressed toward the other end against the urging force when the piston moves toward the other end to close the valve; and
indicate means adapted to indicate "open" when the sleeve is pressed toward the one end, indicate "closed" when the sleeve is pressed toward the other end, and indicate nothing when the sleeve is restored to the intermediate position by means of the urging means without being pressed by the piston.

5,179,975

CHEMICAL MIXING AND DELIVERY SYSTEM

Jim Stevenson, 3041 Fain La., Georgetown, Calif. 95634

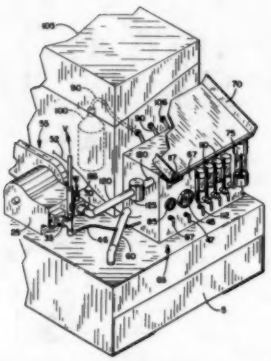
Filed Oct. 24, 1991, Ser. No. 782,375
Int. Cl.[5] E03B *5/00*
U.S. Cl. 137—565 **10 Claims**

1. A dynamic, non-recycling pumping system for combining at least one chemical agent with a liquid carrier to produce a mixture for spraying on a target, comprising:
a) a pump having an associated output line and an associated primary suction input line, wherein said pump generates a pressurized output flow of said mixture in said output line and produces a vacuum within said primary suction input line;
b) a carrier reservoir for containing said carrier, wherein said primary suction input line connects said pump to said reservoir;

c) means for regulating said pump's pressurized output flow of said mixture;

d) means for determining the level of vacuum within said primary suction input line;

e) means associated with said primary suction line for establishing a desired flow rate of said carrier from said carrier reservoir;



f) a secondary suction input line for transferring said chemical agent into said primary suction input line; and

g) means associated with said secondary suction input line for establishing a flow rate of said chemical agent into said primary suction input line.

5,179,976

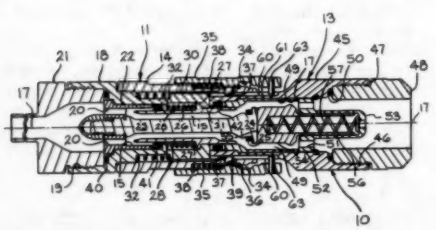
FLUID COUPLING

John D. Boland; Paul J. Fournier; John C. Field, all of Jackson, Mich., and David S. Densel, Convoy, Ohio, assignors to Aeroquip Corporation, Jackson, Mich.

Filed Dec. 23, 1991, Ser. No. 811,609

Int. Cl.[5] F16L *37/28*

U.S. Cl. 137—614.06 **5 Claims**



1. A fluid coupling comprising, in combination, first and second coupling parts, each of said first and second coupling parts including a coupling connection end and a passageway, said first and second parts including a valve within the passageway adapted to open upon interconnection of said first and second coupling parts, said first coupling part comprising a male coupling part having a nose surface defining at least one guide groove, said second coupling part comprising a female coupling having at least one key pin extending inwardly and receivable by said guide groove, whereby said coupling parts can be interconnected upon alignment of said key pin with said guide groove and whereby said coupling parts cannot be interconnected without alignment of said key pin within guide groove.

5,179,977

FLOW CONTROL DEVICE

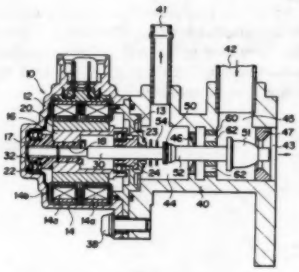
Kouichi Iwata, and Katsuyoshi Fukaya, both of Oobu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Japan

Filed Feb. 1, 1991, Ser. No. 649,662

Claims priority, application Japan, Feb. 20, 1990, 2-15794; Apr. 6, 1990, 2-37501

Int. Cl.[5] F16K *11/04*

U.S. Cl. 137—625.5 **9 Claims**



1. A flow control device comprising:

a casing with an actuator incorporated therein;

an operating shaft projected from said casing and actuated for axial reciprocation by said actuator, said operating shaft having a first and a second valve bodies mounted axially spaced from each other;

a fluid dispensing housing fixed to said casing and having an inner space in which said operating shaft is accommodated, said fluid dispensing housing having a first and a second fluid outlets spacedly from each other in the axial direction of said operating shaft and further having one and single fluid inlet;

a first valve seat provided between the fluid inlet and the first fluid outlet in said housing and functioning to control the flow rate of fluid flowing from said fluid inlet toward said first fluid outlet in cooperation with the first valve body mounted on said operating shaft;

a second valve seat provided between the fluid inlet and the second fluid outlet in said housing and functioning to control the flow rate of fluid flowing from said fluid inlet toward said second fluid outlet in cooperation with the second valve body mounted on said operating shaft; and

said first valve seat and said second valve seat being positioned to come into contact with said first valve body and said second valve body, respectively, by movement of said operating shaft in one axial direction thereof, whereby, fluid flow flowing out of said fluid dispensing housing through said first fluid outlet and said second fluid outlet is simultaneously increased and decreased depending on the direction of the movement of said operating shaft.

5,179,978

ROTARY INK VALVE ASSEMBLY FOR CONTROLLING INK OR PRINTING FLUID INPUT IN A PRINTING PRESS

Tammy J. Simms, Darien, and Frederick J. Whiting, La Grange, both of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 30, 1991, Ser. No. 737,856

Int. Cl.[5] F16K *11/085*

U.S. Cl. 137—625.46 **23 Claims**

1. A rotary ink valve for providing ink in a printing press having an ink supply, comprising:

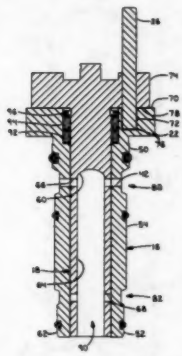
stationary outer portion having first and second ends connected by a body, said body having a substantially cylindrical interior area and having a plurality of bypass apertures in said body adjacent said first end of said outer portion and a plurality of ink output apertures in said body

adjacent said second end of said outer portion, said first and second ends being open;

substantially tubular inner portion lying within and rotatable within said cylindrical interior area of said outer portion and having first and second ends connected by a side wall, and having a plurality of bypass apertures in said side wall adjacent said first end of said inner portion and a plurality of ink output apertures in said side wall adjacent said second end of said inner portion, said second end being open and said first end being closed;

said ink supply coupled to at least said open second end of said inner portion for supplying ink to said inner portion; and

means for rotating said inner portion between at least an open position, a closed position and an intermediate position, said intermediate position being between said open and closed positions;



wherein, in said open position only said plurality of ink output apertures in said inner portion aligns with said plurality of ink output apertures in said outer portion such that ink flows from said plurality of ink output apertures of said outer portion, wherein in said closed position, only said plurality of bypass apertures in said inner portion aligns with said plurality of bypass apertures in said outer portion, such that ink flows from said plurality of bypass apertures of said outer portion, and wherein in said intermediate position said plurality of bypass apertures and said plurality of ink output apertures in each of said inner and outer portions are misaligned such that no ink flows from said plurality of bypass apertures of said outer portion and no ink flows from said plurality of ink output apertures of said outer portion.

5,179,979

RAPIER LOOM WITH INCLINED TAPE GUIDE

Hans Zollinger, Tann-Ruti, Switzerland, assignor to Sulzer Brothers Limited, Winter, Switzerland

Filed May 24, 1991, Ser. No. 705,318

Claims priority, application Switzerland, Jul. 16, 1990, 02364/90

Int. Cl.[5] D03D *47/18*

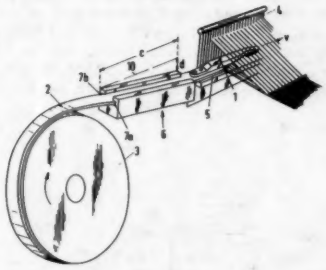
U.S. Cl. 139—449 **9 Claims**

1. A rapier loom comprising

a raceboard for supporting a picking tape in a shed of warp yarns;

a picking tape for movement into the shed;

a rapier head secured to said tape and having a center of gravity disposed above a top of said tape; and



means for guiding said tape at a downward inclination towards the shed, said means being located outside the shed.

5,179,980

WEFT YARN BRAKE WITH LOGIC CIRCUIT CONTROL

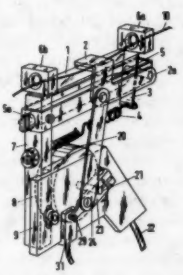
Oskar Hubner, Radolfzell, and Rudolf Stauner, Konstanz, both of Fed. Rep. of Germany, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 4, 1991, Ser. No. 754,571

Claims priority, application Switzerland, Sep. 10, 1990, 02935/90

Int. Cl.[5] D03D *47/34*

U.S. Cl. 139—450 **9 Claims**



1. A yarn brake for a loom comprising:

a brake band including a resilient metal band which is tensioned by means of a spring;

a braking member for pressing a weft yarn against said brake band;

an actuating motor having a rotatable shaft;

means connected between said shaft and said member for driving said braking member with a linear movement in response to rotation of said shaft; and

a triggering and logic circuit arrangement for driving said motor.

5,179,981

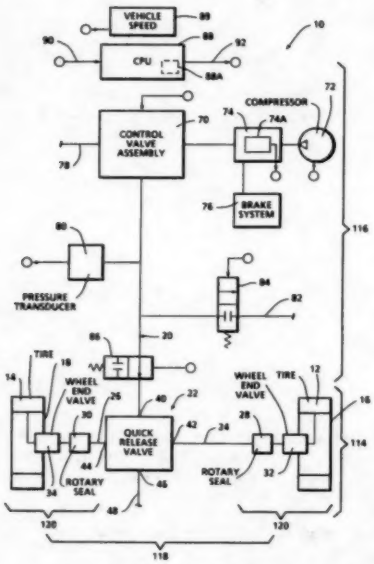
FAULT DETECTION METHOD FOR CENTRAL TIRE INFLATION SYSTEM

Bradford W. Hicks, Kalamazoo; Brian R. Blust, Rochester; James A. Beverly, and Gary R. Schultz, both of Kalamazoo, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 483,341, Feb. 20, 1990, Pat. No. 5,121,774, which is a continuation of Ser. No. 198,530, May 25, 1988, abandoned. This application Mar. 12, 1992, Ser. No. 828,636

Int. Cl.[5] B60C *23/16*

U.S. Cl. 141—4 **6 Claims**



1. A diagnostic method for sensing unacceptable operating conditions in an on-board CTIS of the type comprising a control valve assembly (**70**) for selectively pressurizing and venting a controlled fluid conduit (**20**), a tank (**74**) for accumulating pressurized air, means for selectively fluidly connecting and isolating said control valve assembly and said tank which is a two-position pressure switch means (**74A**) communicating with the pressurized interior of said tank and movable from a first position (open) to a second position (closed) if the pressurization in said tank exceeds a first reference value and movable from said second position to a first position if the pressurization in said tank is less than a second reference value, said first reference value being greater than said second reference value, said pressure switch means generating a signal indicative of the position thereof, means for sensing vehicle speed and generating a signal indicative thereof, and control means for receiving input signals and processing said input signals to generate command output signals, said control means effective to generate command output signals prohibiting fluid communication between said tank and said control valve upon receiving an input signal indicating said pressure switch is in the first position thereof, said method characterized by:

sensing the position of said two-position pressure switch:

sensing the speed of the vehicle;

if said two-position pressure switch remains in the first position thereof for at least a preselected period of time while vehicle speed exceeds a reference speed, preventing further operation of the CTIS.

5,179,982

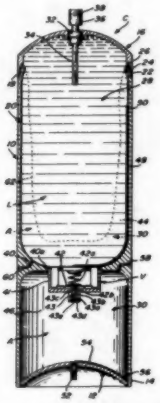
APPARATUS FOR DISCHARGING A FLUID AND, MORE PARTICULARLY, FOR SPRAYING A LIQUID

Martin Bérubé, 5440 - 74 boul. Talbot, Laterrière, Québec, Canada G0V 1K0 ; Julien Bilodeau, 940 Thérèse-Casgrain, Apt. 129, Chicoutimi, Québec, Canada G7H 6K8 ; Marlène Paul, 1273 boul. Renaud, Apt. 9, Chicoutimi, Québec, Canada G7H 3N7 ; Ronald Gaucher, 4295 St-Martin, Chicoutimi, Québec, Canada G7H 5A7 ; Germain Côté, and Guy Boudreault, both of Chicoutimi, Canada, assignors to Martin Bérubé, Laterrière; Julien Bilodeau, Chicoutimi; Marlène Paul, Chicoutimi and Ronald Gaucher, Chicoutimi, all of, Canada

Filed May 23, 1990, Ser. No. 527,448

Int. Cl.[5] B65B *3/00*

U.S. Cl. 141—20 **19 Claims**



1. A fluid dispensing apparatus comprising a container, a displaceable partition means in said container for defining therein first and second separate variable volume chamber means containing respectively a fluid and a propellant means, said second chamber means comprising first and second sub-chambers and a pressure regulating means provided therebetween; said pressure regulating means being adapted so that the propellant means in said first sub-chamber exerts a substantially constant pressure on said partition means and therefore on said fluid, an operable fluid dispensing means extending through said container, into said first chamber means, whereby actuation of said fluid dispensing means causes at least part of said fluid to discharge from said container, said pressure regulating means comprising bleeding means to allow pressurized propellant means to flow therethrough from said first sub-chamber to said second sub-chamber when said second sub-chamber is substantially unpressurized, whereby depressurization of said second sub-chamber also results in the depressurization of said first sub-chamber.

5,179,983

APPARATUS FOR FILLING MULTIPLE RESERVOIR INFUSION SYSTEMS

Edward T. Cordner, Jr., Oceanside; Steven R. Payne, and Glenn J. Istratoff, both of San Diego, all of Calif., assignors to Block Medical, Inc., Carlsbad, Calif.

Filed May 3, 1991, Ser. No. 695,559

Int. Cl.[5] B65B *1/04*

U.S. Cl. 141—27 **21 Claims**

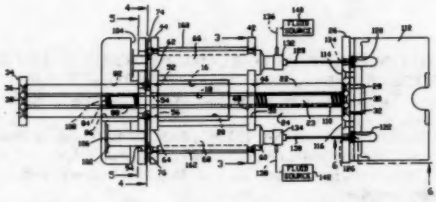
1. A system for simultaneously filling multiple reservoirs of an IV delivery system, comprising:

a support frame;

means on said support frame for positioning a plurality of fill ports of a multiple chamber reservoir to be filled;

a plurality of injection pumps mounted on said frame for injecting a predetermined amount of a fluid;

coupling means for coupling said injection pumps to fill ports of a reservoir positioned on said frame; and



common actuating means for performing the combined functions of sequentially coupling said coupling means to said fill ports and actuating said pumps for filling said reservoirs with a predetermined amount of a fluid.

5,179,984

STORAGE TANK SYSTEM HAVING AN INTERNAL OVERFILL MEANS

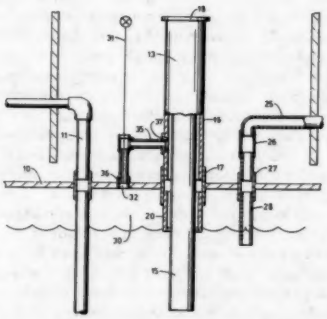
Bruce R. Sharp, 7685 Fields-Ertel Rd., Cincinnati, Ohio 45241

Continuation-in-part of Ser. No. 405,198, Sep. 11, 1989, Pat. No. 5,078,187, and a continuation-in-part of Ser. No. 547,914, Jul. 3, 1990, Pat. No. 5,018,558, which is a continuation of Ser. No. 279,836, Dec. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 66,691, Jun. 26, 1987, abandoned. This application May 28, 1991, Ser. No. 706,046

The portion of the term of this patent subsequent to May 28, 2008, has been disclaimed.

Int. Cl.[5] **F16K** *24/00;* **B65B** *31/00*

U.S. Cl. 141—198 **12 Claims**



1. An underground storage tank system having an internal retained capacity area for receiving overflow of liquid resulting from a filling operation through a delivery hose of a transport tank truck, comprising:

(a) a rigid storage tank having a storage capacity of at least about 1,000 gallons of liquid;

(b) a fill pipe extending from near ground surface into the storage tank for delivering liquid therethrough;

(c) a vapor recovery tube attached to the storage tank and a vapor recovery extension tube extending from the vapor recovery tube into the storage tank with a lower end of said extension tube terminating from about two inches to about eighteen inches from a top inside surface of the storage tank whereby said vapor recovery extension tube and vapor recovery tube receive vapors formed within the storage tank during the filling operation;

(d) a vent line attached to the storage tank and a vent extension line extending from the vent line into the storage tank with a lower end of said vent extension line terminating from about two inches to about eighteen inches from the top inside surface of the storage tank, wherein the area within the storage tank which is above the vapor recovery extension tube termination and vent extension line termination which is uppermost represents the internal retained capacity area;

(e) a dispensing line leading from within the storage tank to a dispenser at ground surface;

(f) a single trapped vapor release valve in operable association with the internal retained capacity area so that when closed during a filling operation a build up of pressure occurs within the storage tank to prevent liquid from completely occupying the internal retained capacity area and when opened permits excess liquid in the fill pipe to freely flow into the retained capacity area; and

(g) a by-pass vent line leading directly from the trapped vapor release valve to the vapor recovery tube so that upon the opening of the trapped vapor release valve trapped vapors in the internal retained capacity area exit the storage tank through the by-pass vent line and vapor recovery tube.

5,179,985

LIFTING AND CRUSHING APPARATUS FOR TREE STUMPS

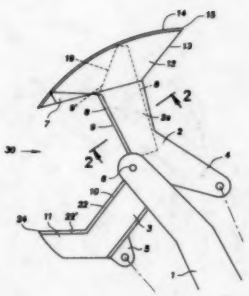
Olli Pallari, SF-95300 Tervola, Finland

Continuation of Ser. No. 509,047, Apr. 13, 1990, Pat. No. 5,081,151. This application Jan. 13, 1992, Ser. No. 819,898

The portion of the term of this patent subsequent to Jan. 14, 2009, has been disclaimed.

Int. Cl.[5] **E02F** *3/28;* **B27C** *9/00;* **B23P** *19/00*

U.S. Cl. 144—359 **10 Claims**



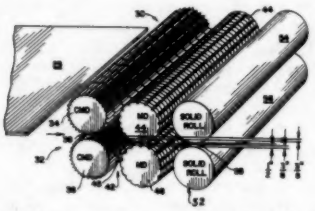
4. A method of removing a rooted tree stump from the ground using a powered stump lifting and crushing apparatus including a housing having a substantially continuous end wall extending to a bifurcated forward portion including spaced hooks projecting away from an intermediately disposed counter bit and an opposed bit arranged for pivotally closing movement with said counter bit comprising the steps of pivotally opening said counter bit and bit, engaging said tree stump with said hooks and positioning said end wall against the ground adjacent the tree stump with said tree stump extending between said counter bit and bit, and prying the tree stump from the ground using said end wall as a support base working against the ground and pivotally closing said counter bit and bit to cut and crush said tree stump to facilitate stump removal.

5,179,986

METHOD FOR IMPROVING FIBERBOARD MAT MOLDABILITY

Lauren J. Beuving, Redwood Valley, and Peter E. Prader, Ukiah, both of Calif., assignors to Masonite Corporation, Del.

Division of Ser. No. 614,247, Nov. 15, 1990, Pat. No. 5,129,435.
This application May 19, 1992, Ser. No. 886,060
Int. Cl.[5] B27M *1/02*; B27B *9/20*
U.S. Cl. 144—362 **15 Claims**



1. A method of conditioning a fiberboard mat having upper and lower surfaces for molding it into a three dimensional object comprising:

making a first series of internally directed discontinuous incisions in the fiberboard mat upper and lower surfaces; and

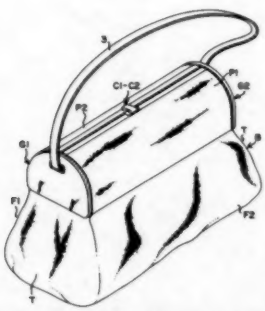
making a second series of internally directed discontinuous incisions in areas of the fiberboard mat upper and lower surfaces which contain the first series of incisions.

5,179,987

BAG, HAND-BAG, AND ANY LIKE TRAVELLING BAG, WITH FOLDING BAG-CLOSING UPPER MEMBER

Pietro Mannato, Bologna, Italy, assignor to Finduck S.r.L., Bologna, Italy

Filed Mar. 18, 1991, Ser. No. 671,093
Claims priority, application Italy, Mar. 16, 1990, 3395 A/90
Int. Cl.[5] A45C *3/00, 3/08, 13/06, 13/10*
U.S. Cl. 150—118 **5 Claims**



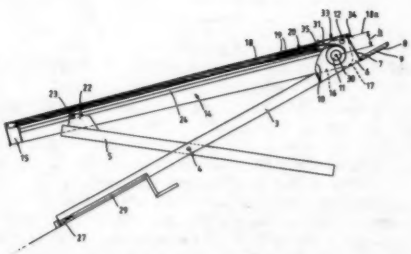
1. A bag having an upper portion containing a rigid, curved framework (A) comprising first and second flat, parallel disk elements with a straight bottom edge and an arcuate, upwardly extending periphery connecting opposite corners of said straight bottom edge, said disk elements being disposed at opposite ends of said framework and transversely to said framework, said opposite corners being connected by stay rods, said disk elements having inwardly facing sides comprising arcuate guide tracks receiving opposite ends of equispaced parallel rods fastened to flexible material pieces having side portions extending longitudinally of said bag and end portions extending over said disk elements, said material pieces having lower edges attached to a respective one of said stay rods and upper edges fitted with at least one slat member provided with a bag-closing means, said material pieces being so disposed that, when said bag is in closed position, said material pieces are stretched over said curved framework and are locked together at an uppermost portion of said framework, and, when said bag is in open position, said material pieces are folded into bellows shape at lower, outwardly facing sides of said framework, a body portion of said bag being attached to said disk elements and to said stay rods.

5,179,988

ROLLING SHUTTER FOR COVER PART OF WALL OR ROOF OPENING, ESPECIALLY FOR ROOF WINDOW

Franz Vorsmann, Marsberger Str. 14, 3538 Marsberg 4,, Fed. Rep. of Germany

Continuation of Ser. No. 479,355, Feb. 13, 1990, abandoned.
This application Nov. 21, 1991, Ser. No. 795,657
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1989, 8901614[U]
Int. Cl.[5] E04F *10/06*
U.S. Cl. 160—32 **4 Claims**



1. A rolling shutter for a roof or wall window, comprising an apron consisting of a plurality of shutter blades; a shaft for rolling up and unrolling said apron and being received in a substantially closed space; two spaced lateral supports fixed with respect to the window for rotatably but stationary supporting said shaft; means coupled to said shaft for rotating it and for thereby rolling up and unrolling said apron; two parallel side parts having rear extensions covering the supports from the outside, being rotatably supported for rotation about a stationary axis extending parallel to said shaft into provided turning positions, and including guides for guiding said apron in rolling-up and unrolling movements thereof and defining a plane; an upper trim extending between said two side parts and connected thereto for covering said apron from above; wherein said closed space is defined by said rear extension and said upper trim; wherein said plane in all rotational positions of said two side parts is spaced from said shaft by a distance; wherein said guides and said shaft define a free space therebetween; and wherein said plane, said distance and said free space are selected such that a damage-free movement of said apron is possible in any one of said provided turning positions of said side parts.

5,179,989

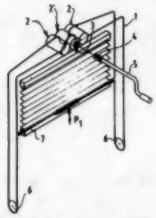
DEVICE FOR TRANSMITTING A DRIVE FORCE BETWEEN A FLEXIBLE ELEMENT AND A ROTATABLE BODY

Siegfried J. Schön, Etten-Leur, Netherlands, assignor to Schon B.V., Breda, Netherlands

Filed May 10, 1990, Ser. No. 521,725
Claims priority, application Netherlands, May 10, 1989, 8901176
Int. Cl.[5] E06B *9/06*
U.S. Cl. 160—84.1 **32 Claims**

10. A liftable blind assembly for selectively opening and closing a generally rectangular opening having left and right

sides, said assembly comprising a movable beam, having left and right ends, at least one flexible drive element arranged in a continuous loop and engaging said movable beam, a drive roll arrangement including at least first, second and third drive rolls, said rolls rotating in alternately opposite rotational senses, first guides at left and right top corners of the opening, second guides disposed adjacent left and right bottom corners of the opening, the continuous loop including a first run, which operatively engages the right end of the movable beam, passes under the second guide at the right bottom corner of the opening, over the first guide at the right top corner of the opening under the first roll, over the second roll, under the third roll



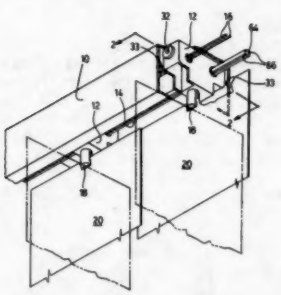
over the first guide at the left top corner of the opening and operatively engages the left end of the movable beam and wherein the continuous loop includes a second run which operatively engages the left end of the movable beam, passes under the second guide at the left bottom corner of the opening, over the first guide at the left top corner of the opening, over the third roll, under the second roll, over the first roll, over the first guide at the right top corner of the opening and operatively engages the right end of the movable beam, wherein said drive element is in frictional contact with peripheral surface portions of said drive rolls over subtending angles totalling at least 360 degrees.

5,179,990

TORQUE LIMITING DRIVE FOR BLINDS

Norbert Marocco, 46 Pennygrass Ct., Woodbridge, Ontario, Canada

Filed Aug. 16, 1991, Ser. No. 746,346
Int. Cl.[5] E06B *9/36*
U.S. Cl. 160—176.1 **40 Claims**



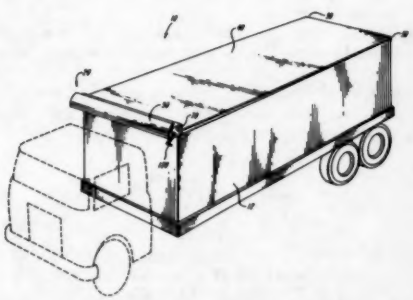
1. A torque-limiting angle drive for blinds and comprising:
drive housing means adapted to be incorporated in a blind;
a drive gear member rotatably supported on said housing means in first bearing means for rotation about its respective axis, and defining worm drive formation means;
a driven gear member rotatably supported on said housing means in second bearing means for rotation about its respective axis;
stop means adapted to define ends of a predetermined arc of rotation less than 360 degrees for said driven member;
a plurality of driven gear tooth formations on said driven member at spaced intervals therearound arranged in a group extending substantially around said predetermined arc of rotation, and adapted to be driven by said worm drive formations and,
a plurality of slipping teeth arranged on said driven member and located whereby when said driven member reaches one or other end of its predetermined arc of rotation, said slipping teeth are disengaged whereby to provide a slipping action when said drive member is over-rotated and wherein said slipping teeth define a profile having a generally arcuate concave shape, whereby to permit said worm drive formations to slip thereon.

5,179,991

RECEPTACLE COVER

Edward N. Haddad, Jr., Worcester, Mass., assignor to Pioneer Consolidated Corporation, North Oxford, Mass.

Filed Dec. 11, 1990, Ser. No. 626,674
Int. Cl.[5] B60P *7/04*; E06B *9/68*
U.S. Cl. 160—310 **15 Claims**



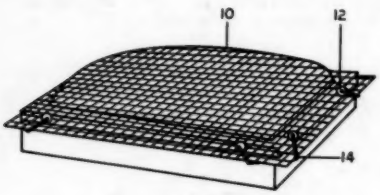
1. A covering apparatus for a receptacle having an open top comprising:
a cover having a first end, a second end, and two sides, said cover being of a length and width sufficient to cover no more than said open top;
a spring loaded roller, rotatably mounted at one end of the receptacle, and to which said first end of said cover is attached, said roller adapted for retracting and winding said cover about said roller;
a cable having a first end, a second end, and a length disposed between said first and second ends, said length being exposed and free when said cable is unspooled, the first end of said cable being attached to said second end of said cover, said cable being for unwinding said cover from said roller; and
a cable spool, rotatably mounted at one end of the receptacle and attached to which is the second end of said cable, for spooling and unspooling said cable,
energizing means for causing said cable spool to rotate in one direction so as to spool said cable and to rotate in the other direction so as to unspool said cable,
said apparatus having a covered configuration in which said cover is unwound from said roller and extends substantially over only the opening of the receptacle, said cover being secured only at said first and second ends, and an uncovered configuration in which said cover is wound about said spring loaded roller and said top of said receptacle is uncovered.

5,179,992

SELF CONTAINED REMOVABLE SUNSHADE FOR THE EXTERIOR OF CURB-MOUNTED SKYLIGHTS

Steven E. Okarski; Scott E. Okarski, and Carol Okarski-Lawlor, all of 128 Cedarwood Village Cir., Daytona Beach, Fla. 32119

Filed Sep. 6, 1991, Ser. No. 755,750
Int. Cl.[5] A47H *23/00*
U.S. Cl. 160—327 4 Claims



1. A skylight sunshade comprising:

a thin, flat, flexible sheet of screening material, said sheet having an open weave design to permit ample lighting and outward visibility therethrough while also providing solar shading properties;

said sheet having at least one pair of apertures located near an edge thereof;

at least one elastic cord having ends extending through each of the holes of each said pair of holes, thereby forming a loop,

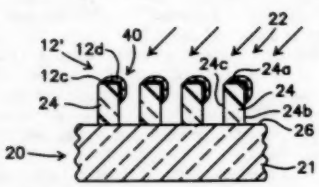
whereby, said sheet is adapted to by placed over a skylight with said loop extending over an edge portion thereof thereby securing said sheet to said skylight.

5,179,993

METHOD OF FABRICATING ANISOMETRIC METAL NEEDLES AND BIREFRINGENT SUSPENSION THEREOF IN DIELECTRIC FLUID

Chan S. Bak, Newbury Park; Leroy J. Miller, Canoga Park, and Camille I. Van Ast, Newbury Park, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 26, 1991, Ser. No. 674,987
Int. Cl.[5] B22D *23/00*
U.S. Cl. 164—46 16 Claims



1. A method of fabricating anisometric needles, comprising the steps of:

(a) providing a substrate having a grating of parallel ridges formed in a surface thereof, each ridge having a top and first and second opposite sides;

(b) depositing metal onto the grating at an angle selected such that said metal is deposited onto the tops and first sides of the ridges to form generally L-shaped metal strips;

(c) cutting the metal strips at periodic intervals along the ridges to form said needles; and

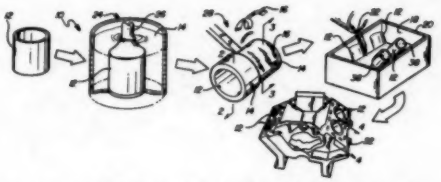
(d) removing said needles from the grating.

5,179,994

METHOD OF ELIMINATING POROSITY DEFECTS WITHIN ALUMINUM CYLINDER BLOCKS HAVING CAST-IN-PLACE METALLURGICALLY BONDED CYLINDER LINERS

John W. Kuhn, Bristol, Ind., assignor to CMI International, Inc., Southfield, Mich.

Filed Jan. 16, 1992, Ser. No. 821,229
Int. Cl.[5] B22D *19/00*
U.S. Cl. 164—100 6 Claims



1. A method of eliminating shrinkage defects within aluminum cylinder block castings having metallurgically bonded cast-in-cast place cylinder liners, said method comprising the steps of;

forming a metal cylinder liner (**12**);

metallurgically bonding a zinc-based metal coating material (**14**) to the liner (**12**) forming an alloyed layer of coating and liner metal adjacent the liner and an outer layer of essentially pure zinc coating material;

depositing the coated liner (**12**) within a cavity (**18**) of a cylinder block casting mold (**20**);

casting molten aluminum cylinder block metal (**22**) into the cavity (**18**) and around the coated liner (**12**) causing the coating (**14**) to melt and further alloy with the cylinder block metal (**22**) and allowing the cylinder block metal (**22**) to solidify and metallurgically bond with the liner (**12**);

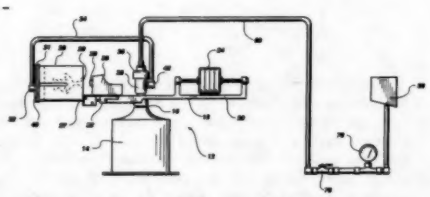
and removing a sufficient amount of the outer coating layer prior to casting which would otherwise melt during casting and infiltrate the cylinder block metal (**22**) forming undesirable shrinkage defects within the resultant block (**22**) upon solidification while maintaining a remaining portion of such outer layer material intact to provide corrosion protection to the liner prior to casting.

5,179,995

COMBINATION VACUUM ASSIST CENTRIFUGAL CASTING APPARATUS AND METHOD

Stanley R. Limb, 1721 E. 7200 South, Salt Lake City, Utah 84121

Continuation-in-part of Ser. No. 380,387, Jul. 17, 1989, abandoned. This application Jan. 28, 1991, Ser. No. 646,806
Int. Cl.[5] B22D *13/00*
U.S. Cl. 164—114 6 Claims



1. An ambient air combination centrifugal force and aligned directional vacuum assist casting method to fill a pre-heated casting flask at a desired casting temperature having a mold with a pour opening in communication with the pour opening

of a casting crucible filled with molten metal and ceramics, comprising:

centrifugally spinning with an arm centrifuge apparatus the heated casting flask and casting crucible with their pour openings aligned such that the resulting centrifugal forces empty the contents of the casting crucible into the casting flask; while simultaneously

applying a vacuum in the direction of the centrifugal forces to the casting flask in a manner to evacuate trapped gases and unburned hydrocarbons from the mold and assist in drawing in the molten metal and ceramics into the mold; said centrifuge apparatus having:

a. a drive motor having a shaft,

b. a rotating arm attached to the shaft of the motor to form two rotating arm segments spun by the action of the motor, said first arm segment having a mount proximate its end positioned next to a casting crucible with an open top and pour spout, and a second arm with a movable counterbalancing weight attached to counterbalance the apparatus during rotation by the drive motor,

c. a casting flask with a mold having a pour opening removably mounted onto the mount with its pour opening in alignment with the casting crucible pour spout to be filled by molten metals and ceramics in the casting crucible, when centrifugally rotated,

d. a butt plate with a heat insulation pad seal associated with the mount structured to form a vacuum seal with the bottom of the casting flask when placed on the mount, said butt plate and heat insulation pad seal having an exhaust port sealed in communication with the bottom of the casting flask, and

e. a rotating vacuum valve attached to the rotating arm between the arm segments, having

i. a rotating body having walls defining an internal vacuum reservoir in communication with a receiving port in the walls of the rotating body,

ii. a tube connecting the exhaust port of the butt plate with the receiving port of the rotating body to form an evacuation path leading to the vacuum reservoir,

iii. a stationary dust cap rotatably sealed onto the rotating body having an evacuation port in communication with the vacuum reservoir and a vacuum source to selectively apply the desired vacuum to the bottom of the casting flask during centrifugal rotation of the casting flask to remove trapped gases and air born materials from the mold, while assisting in drawing molten metal and ceramics into said mold.

5,179,996

PROCESS AND DEVICE FOR CONTINUOUS CASTING ON A ROLL OR BETWEEN TWO ROLLS

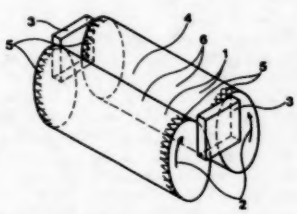
Philippe Blin, Lorry-lés-Metz; Laurent Sosin, Fameck, and Dominique Loison, Woippy, all of France, assignors to Usinor Sacilor, Puteaux, France

Continuation of Ser. No. 607,116, Nov. 2, 1990. This application May 28, 1992, Ser. No. 889,428

Claims priority, application France, Nov. 23, 1989, 89 15539

Int. Cl.[5] B22D *11/06*

U.S. Cl. 164—428 **8 Claims**



1. Device for casting thin metal products on a roll or between two rolls, said device comprising at least one roll for driving in rotation and including a cooled wall, and side walls defining with said at least one roll a casting space, said at least one roll having an outer surface which is divided into at least three circumferential rough zones, at least one of said zones a roughness greater than the roughness of the other zones, said at least one zone of greater roughness defining a means for preferentially driving a corresponding zone of a product engaged therewith, and wherein the roughness (Rz) of said at least one zone of greater roughness is at least twice the roughness (Rz) of said other zones.

5,179,997

PROCESS FOR INSULATING MOLTEN STEEL DURING CONTINUOUS CASTING

Maharaj K. Koul, Pennington, N.J.; Franklin T. Whitaker, Philadelphia, and Richard W. Paul, Wallingford, both of Pa., assignors to Atlantic Metals Corporation, Philadelphia, Pa.

Filed Sep. 12, 1991, Ser. No. 758,736

Int. Cl.[5] B22D *11/00*

U.S. Cl. 164—473 **4 Claims**

1. In a process for producing high quality steel through a continuous casting process, said process including pouring molten steel from a ladle into a tundish and then into a mold, wherein an slag is provided on top of the molten steel in the tundish to absorb impurities and to help insulate the molten steel therein, the improvement which comprises

providing a basic slag which comprises a combination of CaO, MgO, Al_2O_3, and a reactive metal oxide selected from the group consisting of Li_2O, SrO_2, TiO_2, Na_2O, BaO, wherein the composition contains SiO_2 in an amount less than 15% by weight, wherein the slag maintains a melting and crystallization temperature of at least 1450° C. while absorbing and retaining at least 10% by weight Al_2O_3 therein;

spreading the slag over the molten steel in the tundish while maintaining the temperature of the molten steel at least at 1535° to maintain the fluidity of the slag; and

retaining the molten steel in the tundish for a sufficient period of time to provide absorption of all excess Al_2O_3 from the molten steel into the slag.

5,179,998

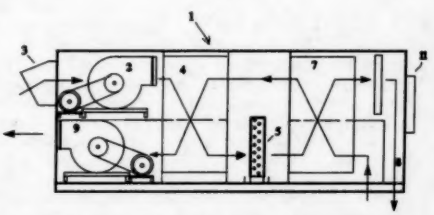
HEAT RECOVERY VENTILATING DEHUMIDIFIER

Nicholas H. Des Champs, P.O. Box 3049, Fincastle, Va. 24090

Filed Jan. 24, 1992, Ser. No. 825,266

Int. Cl.[5] F25D *17/06*; **F25B** *29/00*

U.S. Cl. 165—1 **19 Claims**



14. A method of providing fresh, cool, dehumidified air to an air conditioned building or room comprising drawing fresh air into a first heat exchanger through a duct connected between the first heat exchanger and an air inlet located outside of the building, cooling the fresh air in the heat exchanger by heat exchange with a return air stream, then further cooling the cool fresh air by a refrigeration source to dehumidify the cool, fresh air, then passing the cool, fresh, dehumidified air through a second heat exchanger in heat exchange relationship with

return air from the building or room to reduce the relative humidity of the cool, fresh dehumidified air, then introducing the fresh air having reduced relative humidity into the building or room, drawing return air through a return duct to the second heat exchanger from the building or room, thus warming the fresh air and cooling the return air, passing the return air from the second heat exchanger to the first heat exchanger without thermal conditioning thereof and then through the first heat exchanger to rewarm the return air and to cool the incoming fresh air, then discharging the return air through a duct from the first heat exchanger to the atmosphere outside of the building or room.

5,179,999

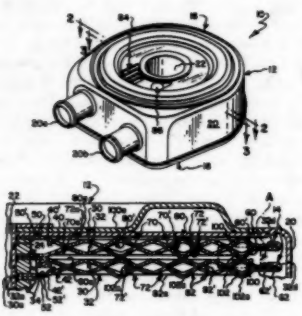
CIRCUMFERENTIAL FLOW HEAT EXCHANGER

Kris J. Meekins, and Jeffrey P. Benson, both of Bemus Point, N.Y., assignors to Long Manufacturing Ltd., Oakville, Canada

Continuation-in-part of Ser. No. 437,680, Nov. 17, 1989, and a continuation-in-part of Ser. No. 484,252, Feb. 26, 1990. This application Dec. 16, 1991, Ser. No. 808,367

Int. Cl.[5] F28F *3/08*

U.S. Cl. 165—41 **17 Claims**



1. A heat exchanger comprising:

a stack of heat exchange units, wherein each of said units is formed from a pair of plates engaging one another and cooperating to define a first flow path therebetween; a pair of adjacent units engaging one another and cooperating to define a second flow path therebetween; the plates of each said pair of plates having inner facing surfaces and outer oppositely facing surfaces, said outer surfaces of said plates each being shaped to define a planar portion, a peripheral portion spaced from said planar portion, a plurality of outer grooves, and outer ribs disposed one between each of said outer grooves, said outer grooves and ribs of a first of said plates of said pair extending in a direction opposite to said outer grooves and ribs of a second of said plates of said pair, said outer grooves forming inner ribs on adjacent inner facing surfaces disposed in surface-to-surface engagement and in a crossing relationship, said planar and peripheral portions of each plate pair being fluid sealed relative to one another, said planar portions of said plates of said pairs of plates being apertured to afford flow communication into and out of said first flow paths of adjacent units and said planar portions of adjacent plate pairs having facing surfaces thereof fluid sealed relative to one another to cause flow between respective first flow paths; said outer ribs having crest portions disposed in a direction normal to said outer surfaces, a plurality of projections formed integrally with said outer ribs and having engagement surfaces, said engagement surfaces of said first plates of said pair being disposed in engagement with said engagement surfaces of said second plates of an adjacent pair of plates of said stack whereby said second flow path is of greater effective cross-sectional area than said first flow path.

9. A heat exchanger unit for a heat exchanger comprising: first and second plates having oppositely facing outer and inner surfaces, said outer surfaces having elongated outer grooves, and elongated outer ribs arranged between said outer grooves and extending co-directionally therewith, said inner surfaces having inner ribs and grooves aligned respectively with said outer grooves and ribs, said inner ribs of said first plate being disposed in an engaged crossing relationship with said inner ribs of said second plate with said inner grooves and ribs cooperating to define a first flow path therebetween, said plates having flow inlet and outlet openings communicating with said first flow path, said outer ribs having crest portions, said crest portions having projections upstanding therefrom.

5,180,000

WORKPIECE CARRIER WITH SUCTION SLOT FOR A DISK-SHAPED WORKPIECE

Rudolf Wagner, Fontnas, and Hans Hirscher, Bad Ragaz, both of Switzerland, assignors to Balzers Aktiengesellschaft, Furstentum, Liechtenstein

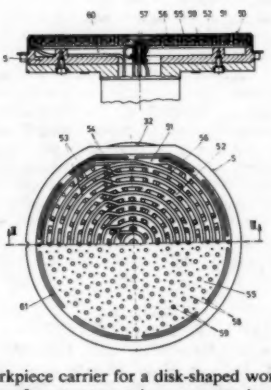
Continuation-in-part of Ser. No. 520,030, May 7, 1990, Pat. No. 5,033,538. This application May 2, 1991, Ser. No. 694,680

Claims priority, application Fed. Rep. of Germany, May 8, 1989, 3915039

The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.

Int. Cl.[5] F28F *7/00;* **C23C** *16/46;* **B25B** *11/00*

U.S. Cl. 165—80.1 **7 Claims**



1. In a workpiece carrier for a disk-shaped workpiece, subjected to a surface treatment in a vacuum installation and having a workpiece support forming a support surface with an outer periphery and for supporting the workpiece, at least one exit aperture terminating in the support surface, a gas feed connected to said at least one exit aperture for supplying a gas to said exit aperture to form a heat transferring gas layer between said support surface and said workpiece, the improvement comprising:

the support surface including, in addition to said exit aperture, at least one suction aperture, said suction aperture being formed as at least one slot extending along a substantial portion of the periphery of said support surface and;

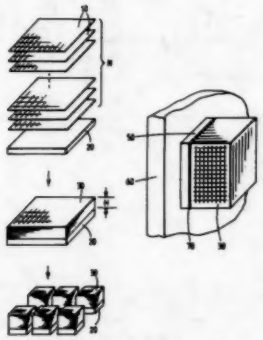
gas suction means connected to said at least one slot for suctioning gas from said slot which comes from said at least one exit aperture, so that a dynamic gas seal is formed at said periphery, said slot having a cross-sectional area and communicating with said suction means along a communication path with a cross-sectional area not smaller than that of said slot considered in a flow direction of gas suctioned through said slot by said gas suction means.

5,180,001

HEAT TRANSFER MEMBER

Ryoji Okada, Shimoinayoshi; Motohiro Sato, Minori; Toshihiro Yamada, Tomobe, and Heikichi Kuwabara, Minori, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 2, 1990, Ser. No. 561,828
Claims priority, application Japan, Aug. 18, 1989, 1-212660
Int. Cl.[5] F28F *13/00*
U.S. Cl. 165—80.4 17 Claims



1. A heat transfer assembly comprising:
a semiconductor element; and
a heat transfer member mounted on said semiconductor element for enabling immersion cooling thereof, said heat transfer member including a heat transfer unit having a plurality of layers laminated and bonded together, each layer of said plurality of layers comprising a mesh of wires.

10. A heat transfer member mounted on a semiconductor element comprising:
a heat transfer unit having a plurality of layers laminated and bonded together, each layer of said plurality of layers comprising a mesh of wires, said heat transfer unit being fixed to a semiconductor element for enabling immersion cooling thereof; and
a mounting sheet bonded to a surface of said heat transfer unit.

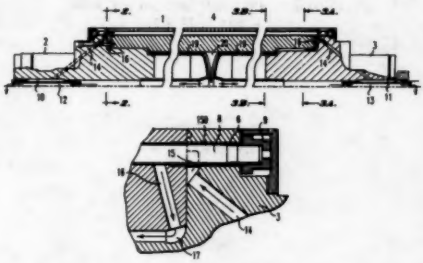
5,180,002

CYLINDER FOR RUBBER MIXING MILL

Martial Schwarz, Cournon-d'Auvergne, France, assignor to Michelin & Cie, Clermont-Ferrand Cedex, France

Filed Mar. 23, 1992, Ser. No. 855,848
Claims priority, application France, Mar. 22, 1991, 91/03607
Int. Cl.[5] F28F *5/02*
U.S. Cl. 165—89 10 Claims

1. A cylinder for a mixing mill, comprising:
a cylinder part having a plurality of longitudinal channels extending therethrough in substantially the axial direction of the cylinder part, said channels being substantially evenly distributed adjacent the external periphery of the cylinder part;
solid rods extending through at least some of said channels to form annular passages therebetween;
means for flowing heat exchanging liquid through said channels so as to form a cylinder temperature regulating circuit, and
flange journals mounted to opposite axial ends of said cylinder part, said rods having ends passing through said flange journals, further including means for securing said rods to



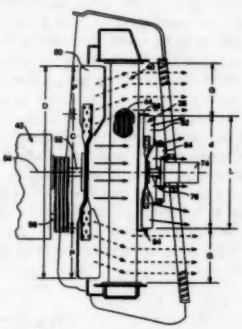
said flange journals such that said flange journals are secured to said cylinder part via said rods.

5,180,003

DUAL FAN COOLING SYSTEM

Richard L. Kouzel, Garner, N.C.; Aubery W. Penn, Washington, Ill.; Brian D. Jensen, Dunlap, Ill., and Paul A. Dicke, Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

PCT No. PCT/US90/00084, § 371 Date Jan. 14, 1992, § 102(e) Date Jan. 14, 1992, PCT Pub. No. WO90/07759, PCT Pub. Date Jul. 12, 1990
PCT Filed Jan. 4, 1990, Ser. No. 838,278
Int. Cl.[5] F28F *13/06*
U.S. Cl. 165—121 14 Claims



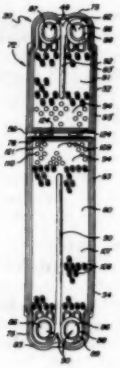
1. A dual fan cooling system (38), comprising:
a heat exchanger (40);
a primary fan (50) having a predetermined diameter (D) rotatably mounted on one side of the heat exchanger (40) for pushing air through the heat exchanger (40) in a preselected direction, the primary fan (50) having a peripheral portion (P) which produces an area (G) of greatest air flow through the heat exchanger (40) and a central portion (C) which produces an area (L) of lowest air flow through the heat exchanger (40); and
a secondary fan (82) having a predetermined diameter (d) smaller than the diameter (D) of the primary fan (50) and being rotatably mounted on the opposite side of the heat exchanger such that a substantially unobstructed flow path exists between said secondary fan and said heat exchanger, (40) at a location sufficient for pulling air through the heat exchanger (40) at the lowest air flow area (L) in the preselected direction and for substantially eliminating recirculation of air through the heat exchanger (40) in the opposite direction.

5,180,004

INTEGRAL HEATER-EVAPORATOR CORE

Hung P. Nguyen, Williamsville, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 19, 1992, Ser. No. 901,473
Int. Cl.[5] F28D *1/03*; F28F *3/08*
U.S. Cl. 165—140 **3 Claims**



1. A unitized heat exchanging assembly comprising:

a plurality of pairs of elongated plates extending between first and second ends forming tube pass elements between said plates and said first and second ends and forming a pair of tanks at each of said first and second ends extending longitudinally through said plurality of pairs of plates and in fluid communication with said tube pass elements, a first of said pairs of tanks receiving a first fluid and a second of said pairs of tanks receiving a second fluid;

said pairs of plates each including longitudinal ribs extending from said pairs of tanks in said tube pass elements for providing flow channels through each of said pairs of plates; and including a partition wall extending through said plates transverse to said longitudinal ribs with the ends of the ribs spaced from said partition wall to isolate said first fluid flowing in said first pair of tanks from said second fluid flowing in said second pair of tanks and for forming a pair of U-channel through said pairs of plates each associated with one of said pairs of tanks.

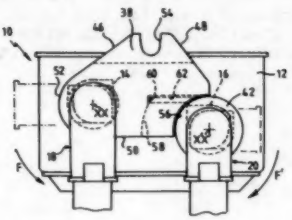
5,180,005

DEVICE FOR MOUNTING TWO PIPE CONNECTIONS ON TWO ADJACENT APERTURES OF A HEAT EXCHANGER CASING

Christian Marsais, Epernon, and Frédéric Letrange, Nanterre, both of France, assignors to Valeo Thermique Moteur, Le Mesnil-Saint-Denis, France

Filed Jun. 18, 1992, Ser. No. 900,574
Claims priority, application France, Jun. 19, 1991, 91 07543
Int. Cl.[5] F28F *9/00*
U.S. Cl. 165—178 **9 Claims**

1. A housing for a heat comprising a casing defining two through apertures adjacent to each other and two tubular pipe connections, the pipe connections and the casing together defining securing means for securing the pipe connections on the casing, wherein each said pipe connection comprises a bayonet end portion for engagement in a respective said aperture, each of the said apertures being configured for bayonet type cooperation with the corresponding bayonet end portion so as to constitute with the latter the fastening means, each bayonet end portion comprising a base portion configured according to the spacing between the said apertures in the casing and defining stop means, the bayonet end portions being adapted to be put into a locking position in relation to the apertures, such that the stop means of the two base portions



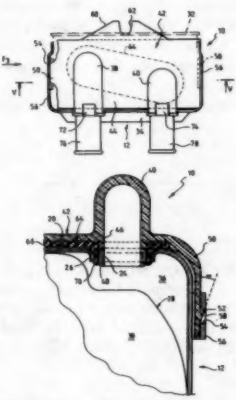
cooperate with each other when both bayonet end portions are in the locking position.

5,180,006

DEVICE FOR MOUNTING TWO PIPE CONNECTIONS ON TWO ADJACENT APERTURES OF A HEAT EXCHANGER CASING

Christian Marsais, Epernon, and Frédéric Letrange, Nanterre, both of France, assignors to Valeo Thermique Moteur, Le Mesnil-Saint-Denis, France

Filed Jun. 18, 1992, Ser. No. 900,411
Claims priority, application France, Jun. 19, 1991, 91 075422
Int. Cl.[5] F28F *9/00*
U.S. Cl. 165—178 **9 Claims**



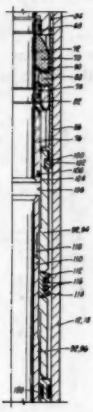
1. A housing for a heat exchanger having a casing formed with two first through apertures adjacent to each other, a base plate carried on the casing and having two orifices aligned respectively with the said first apertures, and a sealing member interposed between the said base plate and casing in the region of the first apertures and the said orifices, wherein the heat exchanger further comprises snap-fitting means carried by the casing and base plate for cooperation with each other so as to attach the base plate to the casing, and two tubular pipe connections joined to the base plate and communicating with the said orifices in the latter.

5,180,007

LOW PRESSURE RESPONSIVE DOWNHOLD TOOL WITH HYDRAULIC LOCKOUT

Kevin R. Manke, Flower Mound; Paul D. Ringgenberg, Carrollton, and Roger L. Schultz, Richardson, all of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 21, 1991, Ser. No. 780,161
Int. Cl.[5] E21B *34/00*
U.S. Cl. 166—321 **19 Claims**



1. An annulus pressure responsive tool apparatus, comprising:

a tool housing;

a power piston slidably disposed in said housing;

a first pressure conducting passage means for communicating a well annulus with a first side of said power piston;

a second pressure conducting passage means for communicating said well annulus with a second side of said power piston;

retarding means, disposed in said second pressure conducting passage means, for delaying communication of a sufficient portion of a change in well annulus pressure to said second side of said power piston for a sufficient time to allow a pressure differential between said first side and said second side of said power piston to move said power piston relative to said housing;

an operating element operably associated with said power piston for movement with said power piston between a first position and a second position of said operating element; and

selectively actuatable bypass means for communicating said first and second passage means and thereby bypassing said power piston so that said operating element will remain in one of its said first and second positions during a subsequent change in said well annulus pressure.

5,180,008

WELLHEAD SEAL FOR WIDE TEMPERATURE AND PRESSURE RANGES

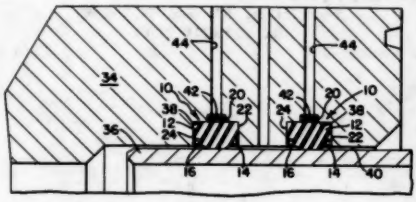
Tod Aldridge, Spring, Tex.; John A. Fitzgerald, Singapore, Singapore; Allan K. McGregor, Sarawak, Mali; Ronald D. Quates; Rudolf R. Schoen, both of Houston, Tex.; Appavoo Thangarasu, Singapore, Singapore, and John C. Vicic, Spring, Tex., assignors to FMC Corporation, Chicago, Ill.

Filed Dec. 18, 1991, Ser. No. 810,753
Int. Cl.[5] E21B *33/04*
U.S. Cl. 166—84 **7 Claims**

1. A wellhead seal for wide temperature and pressure ranges, said seal comprising an assembly of

a) an annular elastomeric body having two flat radial end surfaces, an inner axial surface with a generally convex central portion, and an outer axial surface with a generally concave central portion;

b) a helically coiled annular anti-extrusion ring at the inner



edge of each radial end surface where that surface intersects said inner axial surface; and

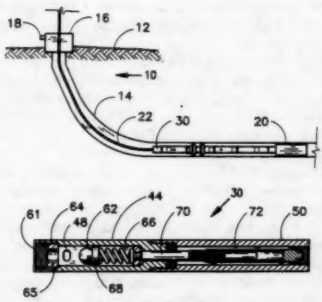
c) an annular energizing element fitted around and residing against said outer axial surface of said body.

5,180,009

WIRELINE DELIVERY TOOL

William Sneed, P.O. Box 1, Cleveland, Okla. 74020

Filed Oct. 28, 1991, Ser. No. 783,175
Int. Cl.[5] E21B *23/10*
U.S. Cl. 166—155 **4 Claims**



1. A wireline delivery tool for an underground well having a pipe, surface seal means to create a seal in said pipe, and a wireline extending from the surface into the pipe, said wireline delivery tool comprising:

a body having a diameter less than the interior diameter of said pipe;

cup means extending from said body to create a seal with said interior of said pipe said cup means including a pair of spaced apart cups;

a longitudinal bore within said body having a port through said body on each side of said cup means; and

pressure valve means within said longitudinal bore to close said bore in the normal operating position, said pressure valve means including a spring forcing a ball against a seat within said bore; and

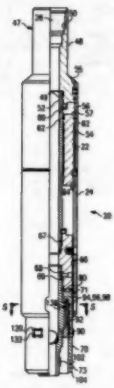
means connected to said body to adjust the pressure required to move said ball away from said seat wherein gas pressure supplied within said pipe between said surface seal means and said cup means will move said delivery tool within said pipe.

5,180,010

MULTIPLE ACTING LOCK FOR GRAVEL PACK SYSTEM

Gregg W. Stout, Montgomery, Tex., and James T. Matte, Broussard, La., assignors to The Western Company of North America, Houston, Tex.

Filed Jul. 26, 1991, Ser. No. 736,389
Int. Cl.[5] E21B *23/04*
U.S. Cl. 166—212 **23 Claims**



1. A multiple acting lock for a gravel pack system, comprising:

(a) a setting sleeve having a first setting sleeve end in operative engagement with a setting piston of a setting tool, a second setting sleeve end in operative engagement with a packer of a gravel pack tool, and an inner surface with at least one recess;

(b) a no-go sleeve disposed concentrically inside said setting sleeve and having a first no-go sleeve end longitudinally fixed on the setting tool, a second no-go sleeve end rotationally engaged with the gravel pack tool, and at least one hole through the side of said no-go sleeve in communication with said at least one recess;

(c) a locking cylinder concentrically disposed inside said no-go sleeve which is hydraulically movable from a locked position to an unlocked position; and

(d) at least one key disposed in said at least one hole that extends into said at least one recess and longitudinally locks said setting sleeve when said locking cylinder is in the locked position, and, when said locking cylinder is in the unlocked position, said at least one key is movable out of said at least one recess by longitudinal movement of said setting sleeve.

5,180,011

METHOD AND DEVICE FOR CARRYING OUT MEASURING OPERATIONS OF INTERVENTIONS IN A WELL

Christian Wittrisch, Rueil-Malmaison, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 25, 1991, Ser. No. 720,367
Claims priority, application France, Jun. 25, 1990, 90 07956
Int. Cl.[5] E21B *47/00*
U.S. Cl. 166—250 **5 Claims**

1. An improved method for carrying out measuring operations or interventions in wells comprising the use of a stiff tubing comprising a side-entry sub, an intervention assembly comprising at least one tool or measuring instrument; positioning said intervention assembly in a first position at a first end of the stiff tubing with a support frame fitted with removable locking means; introducing the intervention assembly associated with said first end into the well; taking down the intervention assembly into the well by lengthening said stiff tubing until the intervention assembly reaches a zone where measuring or interventions are planned; effecting a delayed electric connection of the intervention assembly with an electric-carrying cable unwound from a surface installation, said cable extending from outside to inside of the stiff tubing via an entry of said side-entry sub; displacing said intervention assembly from the first position to a second position where the intervention assembly is moved away from said first end; and immobilizing, on request, the intervention assembly in the well by anchoring the assembly against the walls of the well; the method further comprising;

utilizing an electric connection means fitted with locking elements for allowing the electric-carrying cable and the support frame, after the frame has been taken down into

the well, to be interdependent on request; utilizing said stiff tubing fitted with a piping end having a cross section sufficient to allow the support frame linked to said electric connection means to move totally out of the stiff tubing when said intervention assembly is displaced towards said second position;

withdrawing the stiff tubing after anchoring the intervention assembly in the well on the total length of the measuring or intervention zone, said intervention assembly being directly connected to the surface installation by means of said electric-carrying cable; and

withdrawing the intervention assembly until reaching said first position by exerting a traction on the cable with the surface installation until the support frame is locked, after the support frame has totally returned into the stiff tubing.

5,180,012

METHOD FOR CARRYING TOOL ON COIL TUBING WITH SHIFTING SUB

James B. Crawford, P.O. Box 30636, Lafayette, La. 70503

Division of Ser. No. 404,626, Sep. 7, 1989, Pat. No. 5,029,642.
This application Jun. 4, 1991, Ser. No. 710,083
Int. Cl.[5] E21B *19/22, 31/113*
U.S. Cl. 166—301 **15 Claims**

1. A method for running tools in an oil/gas well on coil tubing comprising:

(a) running an elongated coil tubing string, initially positioned on a reel, down an oil/gas well through an injector head forming a tubing work string;

(b) securing a selective fluid conveying tool, comprising a tool body having an open flow bore and lower connection means movable with respect to the tool body, to the distal end of the coil tubing string, so that fluid can be selectively circulated from the coil tubing on the reel, through

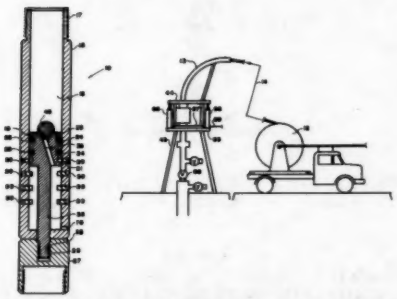
the open flow bore and into the tool, the tool body having an upper portion, a lower portion, and a bottom end; and

(c) equipping said tool with force means for providing a sudden downward forceful movement at said lower connection means, relative to the tool body, the force means comprising:

(i) a piston disposed within the flow bore within the tool body, the piston having an upper surface, the piston having an aperture therethrough allowing continuous fluid circulation through the coil tubing, the upper portion of the tool body, the piston, and out through an aperture in the lower portion of the tool body;

(ii) a ball seat provided in the upper surface of the piston;

(iii) retaining means for releasably retaining the piston within the upper portion of the tool flow bore;



(iv) the piston comprising a piston rod having a first and second ends and being connected to the lower part of a piston head at its first end, the piston rod being provided at its second end with connection means protruding past the bottom end of the tool body, for connection to other tools; and

(v) a setting ball for introduction into the tubing and thereafter into the tool flow bore for fitting into the ball seat at the top of the piston, and for covering the fluid aperture through the piston to restrict the fluid flow through the tool body, and thereby cause a pressure build-up within the tool body sufficient to release the retaining means, to actuate the piston to forcefully move downward upon the release of the retaining means.

5,180,013

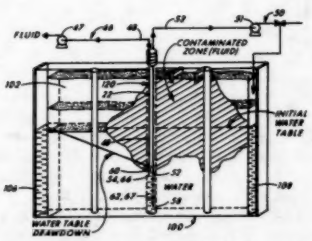
METHOD FOR IN SITU REMOVAL OF A SPILLED FLUID FROM SOIL

Abdul S. Abdul, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 12, 1991, Ser. No. 758,137

Int. Cl.[5] **E21B** *43/12, 43/14, 43/32*

U.S. Cl. 166—370 **8 Claims**



1. A method for extracting a spilled fluid from soil, the fluid being immiscible with and lighter than water and occupying a fluid zone overlying groundwater, thus producing air/fluid and fluid/water interfaces, the underlying water occupying a groundwater zone displaced vertically downward by the fluid relative to an unstressed water table, comprising:

penetrating through the fluid zone and at least partially through the groundwater zone to provide a bore in communication therewith; and then

extracting an amount of fluid from the fluid zone through the bore, the amount selected to maintain contact between at least a portion of the fluid being extracted through the bore and at least a portion of the fluid remaining in the fluid zone; and

separately extracting an amount of water from the groundwater zone through the bore to minimize upward movement of water from the groundwater zone into the fluid zone and to provide or at least maintain a head of fluid above the fluid/water interface adjacent the bore sufficient to cause gravity drainage of the fluid from the fluid zone in a direction generally toward the bore and controlling extraction of the water from the groundwater zone in a manner selected to maintain a major portion of the fluid/water interface and any unstressed portions of the water table at levels closely adjacent the levels occupied prior to commencing any extraction of the fluid and the water to prevent or at least minimize further vertical spread of the fluid.

7. An apparatus for use in removing a spilled fluid from a subsurface of soil through a well bore having an upper end exposed to a top surface of the soil and a distal lower end disposed in the subsurface, the fluid being immiscible with and lighter than water and occupying a fluid zone overlying groundwater, thus producing air/fluid and fluid/water interfaces, the underlying water occupying a groundwater zone displaced downward relative to an unstressed water table, comprising:

a first tube disposed in the bore and a second tube longer than the first tube with a diameter less than the diameter of the first tube, each tube having respective upper ends exposed to the top surface and distal lower ends disposed in the bore, the second tube encompassed by the first tube from the upper ends of each of the tubes to intermediate of the second tube, thereby defining an annular space between the first and second tubes;

sealing means disposed at the lower end of the first tube and intermediate of the second tube and constructed and arranged to isolate the annular space from an interior of the second tube;

perforations in the first tube above the sealing means and below the upper end of the first tube;

perforations in the second tube below the sealing means and above the lower end of the second tube;

first suction means in the first tube constructed and arranged to extract fluid from the annular space;

second suction means in the second tube constructed and arranged to extract water from the interior of the second tube;

first level adjustment means constructed and arranged to cause the first suction means to remain on or just below the air/fluid interface;

second level adjustment means constructed and arranged to cause the second suction means to remain at a level below the fluid/water interface;

first sensor means constructed and arranged to detect a head of fluid above the fluid/water interface and to activate the first suction means when the head is greater than or equal to a predetermined value; and

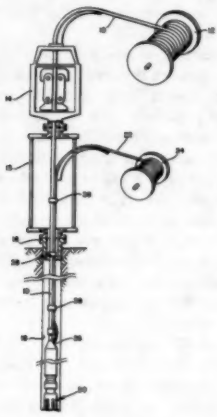
control means constructed and arranged to activate the second suction means so as to maintain the fluid/water interface at a desired level.

5,180,014

SYSTEM FOR DEPLOYING SUBMERSIBLE PUMP USING REELED TUBING

Don C. Cox, Roanoke, Tex., assignor to Otis Engineering Corporation, Carrollton, Tex.

Filed Feb. 14, 1991, Ser. No. 655,086
Int. Cl.[5] E21B *19/00*
U.S. Cl. 166—384 **6 Claims**



1. A method for deploying an electric submersible pump on reeled tubing in a subterranean wall, said method comprising the steps of:

providing reeled tubing;

providing an electric submersible pump; operatively connecting the electric submersible pump to the reeled tubing;

providing electrical cable;

operatively connecting one end of the electrical cable to the electric submersible pump;

aligning the electrical cable substantially parallel to the reeled tubing;

attaching the electrical cable to the outside of the reeled tubing at a plurality of longitudinally spaced locations;

inserting the electric submersible pump into a well bore; and injecting sufficient reeled tubing and electrical cable into the well bore to lower the electric submersible pump to a desired level.

5,180,015

HYDRAULIC LOCKOUT DEVICE FOR PRESSURE CONTROLLED WELL TOOLS

Paul D. Ringgenberg, Carrollton, and Kevin R. Manke, Flower Mound, both of Tex., assignors to Halliburton Company, Duncan, Okla.

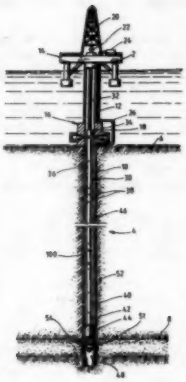
Filed Oct. 4, 1990, Ser. No. 592,686
Int. Cl.[5] E21B *33/12*
U.S. Cl. 166—386 **18 Claims**

1. A well tool having a movable valve member responsive to a change in pressure from a pressure source for selectively moving said movable member, said well tool comprising:

a fluid spring, said movable member being selectively responsive to pressure from said fluid spring;

means for transferring pressure from said pressure source to said fluid spring upon an increase in pressure from said pressure source;

a releasable valve mechanism for substantially preventing communication of pressure from said fluid spring to said movable valve member in a first state, and for communicating pressure from said fluid spring to said movable valve member in a second state.

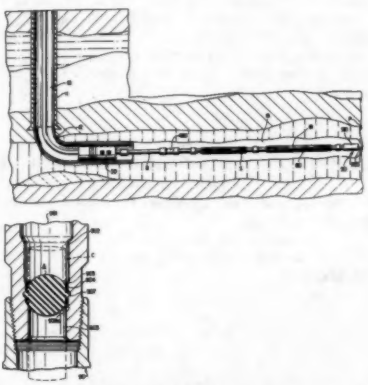


5,180,016

APPARATUS AND METHOD FOR PLACING AND FOR BACKWASHING WELL FILTRATION DEVICES IN UNCASED WELL BORES

Colby M. Ross, Carrollton, and Henry I. Restarick, Plano, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Aug. 12, 1991, Ser. No. 743,792
Int. Cl.[5] E21B *23/04*
U.S. Cl. 166—387 **66 Claims**



1. An expendable plug for inhibiting the unintentional, introduction of fluid power into a flow bore of a well completion apparatus comprising an external mounting collar having a longitudinal flow passage therethrough, mounted within said flow bore so that said flow passage is in flow registration with said flow bore; sealing means about the exterior of said collar and an internal, C-Ring comprising an outwardly biased split ring having a bore hole therethrough, said C-Ring being restrained within the bore of said mounting collar by shearable means protruding from said mounting collar into said bore hole in said C-Ring.

59. A method for completing a partially cased, highly deviated or horizontal well bore comprising:

a. assembling a production string consisting of a ported float shoe having a latch down collar incorporated therein threadedly connected to a plurality of threadedly interconnected well filtration devices, a sleeve valve, a hydraulically operated well packer and a sufficient number of lengths of tubing to reach the surface of said well;

b. concentrically disposing within said production string a work string consisting of a latching collet in flow registration with the flow conduits of said float shoe and being threadedly connected to an anti-blow back ball catcher sub which is in turn threadedly connected to a cup packer having ports connecting the internal bore of said packer with the annulus between said packer and the inner wall of said production string and opposing conical elements disposed on either side of said ports, said cup packer being threadedly connected to a shear joint onto which is slidably and shearably attached a telescoping joint having concentric flow tubes, one being slidably mounted within the other and said tubes being lockable in a fully expanded condition, said expansion joint being threadedly connected to a collet-type ball catcher sub, said ball catcher sub being threadedly connected to a hydraulic setting tool, said setting tool being disposed in engageable relationship with said packer to effect the setting thereof and said setting tool having a ball actuated valve in sealing engagement with the flow ports of said setting tool and sufficient lengths of interconnected tubing to reach the earth's surface;

c. running said production string and said work string into the well bore as a unit and pumping wash fluid through said work string into said well bore through said ports in said float shoe to remove debris from said well bore;

d. positioning said production string at the desired location in said well bore while maintaining said packer within the cased portion of said well bore and thereafter ceasing the pumping of said wash fluid through said work string;

e. dropping an extrudable ball into said work string and pumping fluid down said work string to force said ball into engagement with said ball actuated valve;

f. increasing the pressure applied to said valve and said ball sufficiently to shear hollow shear pins therein thereby simultaneously expending an internal collet catcher from the external mounting collar of said valve and opening flow ports in the packer setting tool;

g. further increasing the pressure applied to said ball to expend said ball from said internal collet catcher into sealing engagement with a second collet catcher;

h. applying pressure sufficient to stroke a piston in said setting tool thereby moving the slips of said packer into binding engagement and the seals of said packer into sealing engagement with the casing of said cased portion of said well bore;

i. further increasing the pressure within said work string to both expel the drop ball from said second collet catcher sub into sealing engagement with an anti-blow back ball catcher sub and to extrude said drop ball into a ball retention groove within said anti blow-back ball catcher sub thereby isolating the flow ports in said float shoe from the remainder of said work string;

j. simultaneously pumping wash fluid down said work string and through the ports in said cup packer while manipulating said work string to reciprocate said cup packer within the bore of said well filtration devices until said wash fluid flows freely therethrough;

k. pulling up on said work string until the upper shoulder of said cup packer is brought into engagement with a packer retention shoulder and continuing said upward pull until said telescoping joint is locked into its fully extended position;

l. pushing down on said work string until said latching collet is restrainedly engaged by said latch down collar;

m. applying sufficient upward force on said work string to shear the shearable means in said shear joint;

n. withdrawing that portion of said work string above said cup packer from the bore of said production string; and

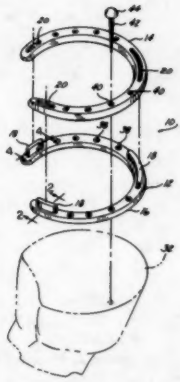
o. attaching such accessory and surface equipment to said production string to place the well in production.

5,180,017

HORSESHOE HAVING REPLACEABLE HORSESHOE PAD

Samuel M. Alagna, 1718 Brentwood, Troy, Mich. 48089

Filed Sep. 3, 1991, Ser. No. 754,031
Int. Cl.[5] A01L *1/04, 5/00*
U.S. Cl. 168—12 **13 Claims**



1. A replaceable horseshoe pad for use with a shoe plate, the horseshoe pad comprising:

a cushioning sole plate:

a plurality of ground contacting cleat-like members each joined to, and extending outwardly from the sole plate, the cleat-like members being adapted to extend through corresponding cleat receiving apertures formed in the shoe plate, wherein the cushioning sole plate and cleat-like members are integrally molded from a multi-durometer polymeric material, with the cushioning sole plate having a first hardness, and the cleat-like members having a second hardness, the second hardness being greater than the first hardness; and

means for securing the sole and shoe plates to a horse's hoof.

5,180,018

SPLIT STACK FIRE-FIGHTING APPARATUS AND PROCESS OF USE

Robert E. Taylor, 2929 Claremont Rd., Shaker Heights, Ohio 44122

Filed May 29, 1991, Ser. No. 706,887
Int. Cl.[5] A62C *3/06*
U.S. Cl. 169—47 **17 Claims**

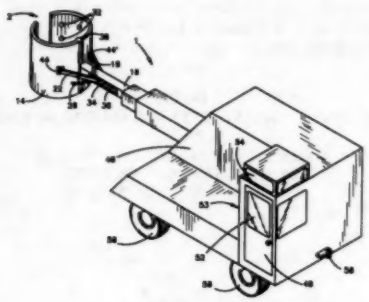
1. A process for extinguishing a fire of an escaping flow of fossil fuel which is burning with a generally upwardly-extending flame front around said flow, the process comprising:

disposing an open-ended stack comprising two vertically hinged sections near said flame front, said stack having inside walls,

pivoting said two sections about a vertical hinge therebetween thereby closing said two sections of said stack around said fuel flow, thereby forming a confined zone that surrounds said flame front laterally,

injecting a flux of quench fluid throughout said zone from a

plurality of apertures that are disposed in said inside walls around the flame front laterally, and



establishing and maintaining the flux of the quench fluid at a rate sufficiently high to extinguish the fire.

5,180,019

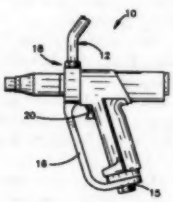
POWER TOOL HAVING SELECTABLE INLET LOCATION

Steven A. Thiry, Easton; Ronald J. Meister, Athens, both of Pa., and David J. Ropp, Flemington, N.J., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Apr. 15, 1991, Ser. No. 685,572

Int. Cl.[5] B23B *45/00*; B25F *5/02*

U.S. Cl. 173—168 **3 Claims**



1. In a power tool of the type having a housing containing a motor powered by an external power source, a single power inlet integral to said housing, and a power switch, the improvement comprising:

external conduit means attachable to said housing and having first and second ends connected by an internal power path, said first end being connectable to said external power source and said second end being detachably connectable to the integral power inlet of the housing, for conducting power from a remote location on the tool housing at said first end to the integral power inlet,

means detachably connected to the housing for shielding said external conduit means to prevent mechanical damage thereto, said shielding means being attachable to said housing so that it cannot be unintentionally displaced, wherein the means for shielding said external conduit means comprises a rigid formed conduit cover having an internal passage in which said conduit is nested and having an external configuration of a trigger grip guard.

5,180,020

METHOD FOR INHIBITING THE INITIATION AND PROPAGATION OF FORMATION FRACTURES WHILE DRILLING

Giin-Fa Fuh, Ponca City, Okla.; Nobuo Morita, Houston, Tex.; Donald L. Whitfill, and David A. Strah, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Oct. 31, 1991, Ser. No. 785,647

Int. Cl.[5] C09K *7/00*; E21B *21/00, 33/138*

U.S. Cl. 175—72 **7 Claims**

1. A method of increasing fracture initiation pressure and fracture propagation pressure during well drilling with a circulating drilling fluid comprising adding to said drilling fluid, prior to encountering formation breakdown, a solid particulate loss prevention material having a size range of from 250 to 600 microns in a concentration which is within ±20 percent of that determined by the equation $C=SG\ (3.5\ MW-14.0)$.

5,180,021

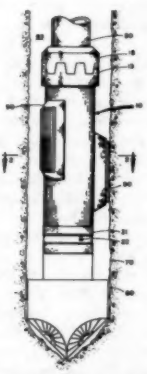
ORIENTABLE STABILIZER

Stephen E. Champion, and Robert A. Philliber, both of P.O. Box 53688, Lafayette, La. 70505

Filed Dec. 21, 1988, Ser. No. 288,019

Int. Cl.[5] E21B *7/08*

U.S. Cl. 175—76 **2 Claims**



1. A stabilizer for supporting and directing a drill bit during directional drilling and for spacing the drill string from the wall of a borehole during conventional drilling, the stabilizer comprising;

a stabilizer body having a plurality of longitudinal ribs, with the outermost surfaces of said ribs being equidistant form the centerline of the drill string, with one or more of said ribs being laterally displaced relative to the outer said ribs, and

means for securing said stabilizer body to the drill string, wherein said securing means includes means for radially adjusting said stabilizer body relative to the drill string, wherein said radially adjusting means comprises; a plurality of interacting splines, and a removable locking nut abutting said stabilizer body whereby the interaction of said splines is maintained.

5,180,022

ROTARY MINING TOOLS

William J. Brady, 1767 Wishingwell Dr., Creve Coeur, Mo. 63141

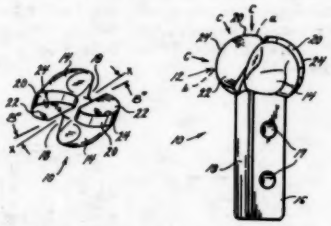
Filed May 23, 1991, Ser. No. 704,885

Int. Cl.[5] E21B *10/54*

U.S. Cl. 175—430 **14 Claims**

1. A roof drill bit mining tool subject to rotary action and

performing cutting functions of drilling and boring as for roof bolting operations in industrial mining and tunnel construction, said mining tool having a tempered steel body with dual oppositely facing support surfaces, and a high density ceramic insert bonded to each of said support surfaces, said high density ceramic insert being constructed and arranged with a polycrystalline diamond layer defining a substantially planar wear surface and having a self-sharpening outer cutting edge with a high entry point and an outer gauge-cutting margin thereon, said planar wear surface being positioned at a negative rake



angle in the range of 5° to 35° and at a negative skew angle in the range of 4° to 10°, both relative to a plane extending normal to the direction of rotation of said mining tool, and the high entry point of each diamond layer initiating its cutting action substantially closer to the axis of rotation of said tool than to the outer gauge-cutting margin thereof, and said cutting edge of each diamond layer extending in a radial direction along a continuous arcuate path from an inner margin substantially at the tool axis to the outer gauge-cutting margin for tool clearance.

5,180,023

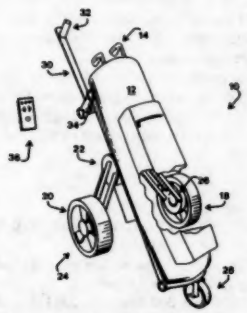
SELF PROPELLED GOLF BAG CART

Eric W. Reimers, 1235 Starwood, Missoula, Mont. 59802

Division of Ser. No. 602,402, Oct. 22, 1990. This application Sep. 18, 1991, Ser. No. 761,390

Int. Cl.[5] B62D *51/04, 11/04, 1/24*

U.S. Cl. 180—19.1 **15 Claims**



8. A golf bag cart assembly for powered transport of a loaded golf bag, comprising;

a folding frame structure which may be expanded to a use mode for use and compacted to a storage mode for storage and transport, the folding frame structure including a central frame for providing support to the side of a golf bag, a caster structure including a caster member pivotally mounted on said central frame and a caster wheel pivotally attached thereto, said caster structure providing bottom support for the golf bag, and a handle structure pivotally mounted upon said central frame, said handle structure including a hand grip member for grasping by a user;

a pair of opposing drive wheel structures mounted upon said central frame by shoulder structures permitting controlled rotation in at least two dimensions, each said pair of drive wheel structures including opposing wheel means and providing with said caster structure, tricycular rolling support for the cart assembly, and independently controlled motor means for providing rotational force to said opposing wheel means;

electrical power storage and delivery means; and

electrical controls mounted on the folding frame structure so as to be readily accessible to the user, the electrical controls including power activation control means, speed control means and directional control means, each of the electrical controls affecting the operation of said motor means;

wherein the cart assembly is generally symmetrical about a longitudinal vertical plane, both in said use mode and said storage mode;

said use mode is characterized by said wheel means being commonly rotated on said shoulder structures in a direction parallel to said longitudinal vertical plane so as to be separated longitudinally from the bottom portion of the folding frame structure, each of said wheel means being opposingly rotated on said shoulder structures in a direction perpendicular to said longitudinal vertical plane so as to displaced outward from said bottom portion, said caster structure being rotated in a direction parallel to said longitudinal vertical plane so as to be displaced from said bottom portion in a direction opposite to the direction of longitudinal displacement of said wheel means, and said handle structure being pivoted outward from the central frame within said longitudinal vertical plane; and

said storage mode is characterized by said wheel means being rotated on said shoulder structure so as to be aligned directly against the opposing sides of the folding frame structure, said caster structure is pivoted so as to be situated between said wheel means, and said handle structure is pivoted so as to lie longitudinally between said wheel means, but displaced above said wheel means, while not projecting longitudinally beyond the extent of the folding frame structure.

5,180,024

VEHICLE HEIGHT CONTROL APPARATUS

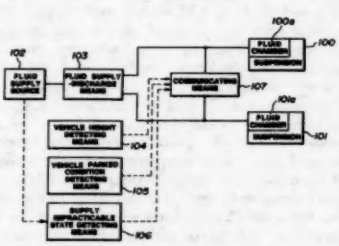
Yoshiyuki Eto, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 18, 1991, Ser. No. 761,469

Claims priority, application Japan, Sep. 18, 1990, 2-247822

Int. Cl.[5] B60G *21/00*

U.S. Cl. 180—41 **6 Claims**



1. A vehicle height control apparatus for a vehicle, comprising:

a right suspension disposed at a right side of at least one of a front wheel side and a rear wheel side of the vehicle, said right suspension including a right fluid chamber through which a vehicle height of the right side is changed;

a left suspension disposed at a left side opposite to said right suspension, said left suspension including a left fluid cham-

ber through which the vehicle height of the left side is changed;

a fluid supply source generating a pressurized fluid and supplying the fluid to said right and left fluid chambers;

valve means controlling the fluid to be supplied to said right and left fluid chambers, respectively, and the fluid to be discharged form said right and left chambers, respectively;

means for detecting the right side vehicle height and the left side vehicle height;

means for detecting a parked condition of the vehicle;

means for detecting an impracticable condition in which said fluid supply source cannot supply the fluid to said right and left fluid chambers; and

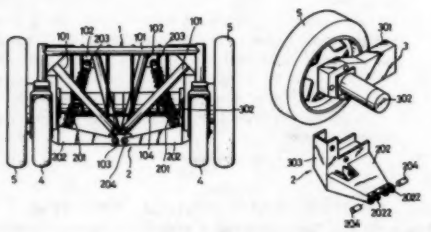
means for communicating said right and left fluid chambers when the difference between the right and left side vehicle heights is greater than a predetermined value, when said parked condition detecting means detects a signal indicative of the parked condition of the vehicle, and when said impracticable condition detecting means detects a signal indicative of an impracticable condition of said fluid supply source.

5,180,025

WHEELED-CHAIR CHASSIS WITH A SUSPENSION MECHANISM

Bean-Shung Yeh; Wu-Yaw Wei; Bean-Horng Su, and Lin-Yun Wu, all of 195,sec,4 chung Hsing Rd, chutung, Hsinchu, Taiwan 31015

Filed Dec. 13, 1991, Ser. No. 808,216
Int. Cl.[5] B60K *1/00*
U.S. Cl. 180—65.5 **1 Claim**



1. A wheeled-chair chassis with a suspension mechanism comprising:

a chassis structure made of a steel pipe frame;

a suspension system including two shock absorbers, two rocker arms and a plurality of pivot pins;

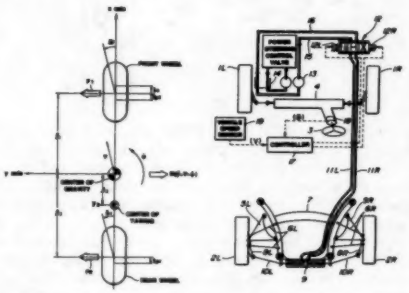
a transmission system including a gear rack attached to an upper end of each said rocker arm in said suspension system, a gear box mounted on said gear rack, a motor mounted on an inner side of said gear box; and characterized in that said steel pipe frame of said chassis structure is an inverse triangular frame, of which an upper end has two joint bases, while a lower end thereof has a joint base for connecting rocker arms; and a center part of said chassis structure having a battery rack; and a front part of said steel pipe frame being mounted with front wheels; and each said suspension system and said transmission system being an independent assembly; and an upper end of each said shock absorber being connected, by means of a pivot pin, with one of said joint base on said upper end of said steel pipe frame, while a lower end of said shock absorber is connected, by means of one of said pivot pin with a shock absorber base of said rocker arm; and a lower end of said rocker arm having two pivot bases for connection with said joint base on lower end of said steel pipe frame by means of one of said pivot pins; and said rear wheels being driven to move by means of said transmission system, and vibration caused by a rough road surface being transmitted from said rear wheels to said rocker arms, and a retractable movement provided with said shock absorbers between said rocker arms and said steel pipe frame for absorbing a vibration caused by a rough road surface.

5,180,026

REAR WHEEL STEERING ANGLE CONTROL SYSTEM FOR VEHICLE

Kazunori Mori, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 483,046, Feb. 21, 1990, abandoned. This application Sep. 6, 1991, Ser. No. 758,454
Claims priority, application Japan, Feb. 21, 1989, 1-39251
Int. Cl.[5] B60G *17/015*; B62D *5/06*
U.S. Cl. 180—140 **9 Claims**



1. A system for controlling a rear wheel steering angle for a vehicle comprising:

first means for sensing vehicle speed to provide a signal indicative thereof;

second means for sensing a steered angle of a steering wheel of the vehicle to provide a signal indicative thereof;

third means for performing a suspension steering control operation on a rear wheel which reduces yaw damping of the vehicle;

fourth means for determining a target steering angle for the rear wheel so as to compensate for reduction of the yaw damping of the vehicle, caused by the suspension steering control of the rear wheel, based on the signals from said first and second means; and

fifth means for performing a yaw damping control operation by controlling an actual steering angle for the rear wheel according to the target steering angle for the rear wheel determined by said fourth means to achieve stable cornering.

5,180,027

TRACTION CONTROL SYSTEM FOR MOTOR VEHICLES

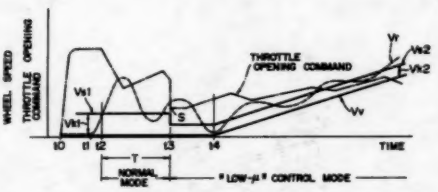
Naoyuki Hagiya, Ageo, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 300,430, Jan. 23, 1989, abandoned. This application Oct. 5, 1990, Ser. No. 593,566
Claims priority, application Japan, Jan. 22, 1988, 63-10835
Int. Cl.[5] B60K *28/16*
U.S. Cl. 180—197 **9 Claims**

1. A traction control system for motor vehicles, wherein a control threshold value for a driven wheel speed is selected based upon a non-driven wheel speed which occurs when the motor vehicles start, and a throttle valve opening is controlled by a throttle driving mechanism so that a driven wheel speed approaches said control threshold value, thereby preventing an excessive slip of the driven wheel when the motor vehicle starts, said traction control system comprising:

first means for measuring a time period in which the traction

control is started and during said time period the non-driven wheel speed is detected as being zero and for providing a signal at a time point when the measurement of said time period becomes equal to or exceeds a predetermined value, wherein said predetermined value measures a point in time when traction control begins to a point where said time period elapses, wherein said predetermined value is the difference between the control threshold value for the driven wheel speed and the control threshold value for a normal mode; and



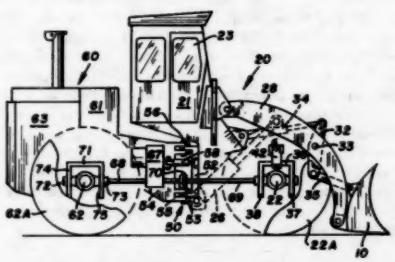
second means for decreasing said throttle opening degree down to a predetermined lower limit value for a low μ control mode in response to said signal provided by said first means, thereby changing the traction control to a controlling mode for a coefficient of friction for a road surface, said control threshold value of the driven wheel speed dropping from a high level to and approaching the non-driven wheel speed level during said time period.

5,180,028

TRACTOR IMPLEMENT ORIENTATION SYSTEM

Stephen A. Perrenoud, Jr., Rte. 4, Box 58, Chippewa Falls, Wis. 54729

Filed Jan. 7, 1991, Ser. No. 638,385
Int. Cl.[5] B60K *17/358*
U.S. Cl. 180—235 **32 Claims**



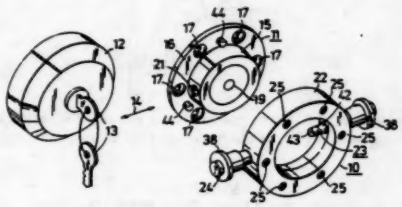
23. A self-propelled articulation-steered tractor comprising a front assembly and a rear assembly in longitudinal relationship, each said assembly comprising a frame having lateral dimensions, said tractor having a vertical-axis articulation pivot joint linking the frame of said rear assembly to the frame of said front assembly, an articulation joint transverse swivel pivot system for transverse swivel pivot movement between the frames of said front and rear assemblies, and operator-actuated power means mounted for positively controlling the transverse swivel pivot movement of said articulation joint transverse swivel pivot system at an operator's discretion.

5,180,029

ANTI-THEFT DEVICE

Johan Rosenlund, P.O. Box 16, 186 94 Vallentuna, Sweden

PCT No. PCT/SE90/00255, § 371 Date Oct. 10, 1991, § 102(e) Date Oct. 10, 1991, PCT Pub. No. WO90/13459, PCT Pub. Date Nov. 15, 1990
PCT Filed Apr. 17, 1990, Ser. No. 768,291
Claims priority, application Sweden, May 8, 1989, 8901619
Int. Cl.[5] B60R *25/02*
U.S. Cl. 180—287 **10 Claims**



1. An anti-theft device in the form of a coupling which acts between a steering wheel and a steering-wheel shaft and which includes two coupling-halves (**10,11**) which are rigidly connected to an outer end of the steering-wheel shaft and to the centre of the steering wheel respectively, and which further includes connecting means (**23,35**) active between said coupling-halves and operative to connect the said coupling-halves detachably together, wherein the one coupling-half (**11**) has provided thereon a plug (**15**) which widens towards one end thereof and a support surface (**16**) located at said one end of the plug and projecting outwards substantially in the transverse direction of said plug, whereas the other coupling-half (**10**) includes a sleeve (**22**) which fits the plug (**15**) and which, in the mutually coupled state of said coupling-halves, receives the plug and in turn is supported by said support surface (**16**), and wherein the connecting means (**23,35**) comprise locking plungers (**23**) which are spring-biassed in a radially inward direction and which pass through the wall of said sleeve and are intended to be received in recesses (**20,21**) provided in said plug (**15**), characterized in that each locking plunger (**23**) and associated recess (**20,21**) in the plug are configured as a wedge assembly which, in the mutually coupled state of said coupling-halves (**10, 11**), strives to press the sleeve (**22**) in a direction towards said support surface (**16**) while preventing movement of the sleeve in a direction away from the support surface and wherein a pressure-spring device (**33**) is active between said support surface (**16**) and the end-surface (**32**) of the sleeve facing said support surface.

5,180,030

TREE OR VERTICAL SUPPORT STAND

Paul W. Smaby, 4643 Harriet Ave S., Minneapolis, Minn. 55409

Filed Mar. 5, 1992, Ser. No. 846,021
Int. Cl.[5] A01M *31/00*
U.S. Cl. 182—187 **8 Claims**

1. A tree stand for allowing the user to position him or herself in an elevated position in a tree or other vertically positioned support including:

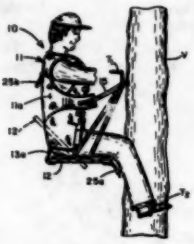
a. a vest unit for wear by the user and substantially encompassing the upper torso of the unit;

b. a pair of vest extensions arranged on said vest and extending forwardly from said vest unit;

c. a pair of strap members extending from the respective ends of each of said extensions and attachable to the vertical support;

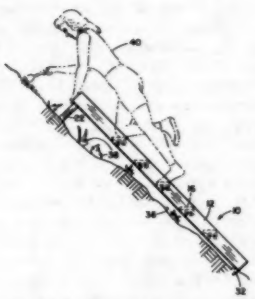
d. a seat section including flexible connection means to connect the same to the lower rear side of said vest portion and shiftable from a first position adjacent the back of said vest for transport thereof and shiftable therefrom to a

second position below said the user to allow the user to sit thereon; and,



e. the ends of said seat portion being provided with flexible strap means for attaching the same to the vertical support.

5,180,031
GARDENER'S AID FOR SLOPED GROUND
Daniel S. Smith, 6004 S. Atlanta Ct., Tulsa, Okla. 74105
Filed Dec. 11, 1990, Ser. No. 625,904
Int. Cl.[5] E06C *1/00*
U.S. Cl. 182—194 **3 Claims**



1. A gardner's aid for use on sloped ground to support a gardener in close proximity to sloped ground, comprising:

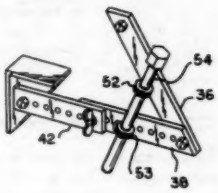
a first and second elongated linear strut members spaced apart from and generally parallel to each other, each having a first end and a second end and each having a longitudinal axis;

a plurality of generally flat spaced apart support members, each support member having one end affixed to said first strut member and the other end affixed to said second strut member, the support members being in planes paralleled to each other and at an acute angle to the longitudinal axis of each of said strut members;

first and second arm members affixed respectively to said first and second strut members adjacent said first ends thereof, said arm members extending in a plane substantially perpendicular to the plane of the strut members longitudinal axii and being of relative short length compared to the length of said strut members, each arm member having a blunt outer end spaced from said strut member to resist ground penetration, the gardener's aid being positionable on sloped ground whereby said support members are generally horizontal providing surfaces for receiving the feet, knees or hands of the user, said strut members second ends serving to contact sloped ground and to support said strut members and said support members above and generally parallel to and in close proximity with sloped ground; and

a retractable retention pin affixed to each of said strut members adjacent said second ends thereof and moveable between an operating position and a storage position and when in the operating position the retention pins extending generally perpendicular to said longitudinal axis of each said strut member and serving to penetrate ground to aid in preventing the gardener's aid from sliding on sloped ground.

5,180,032
LADDER STABILIZER APPARATUS
Martiniano A. Hidalgo, 404 First Ave., Elizabeth, N.J. 07206
Filed Mar. 9, 1992, Ser. No. 848,073
Int. Cl.[5] E06C *7/48*
U.S. Cl. 182—214 **3 Claims**



1. A ladder stabilizer apparatus for use with a ladder member, the ladder member includes a first ladder leg parallel to and coextensive with a second ladder leg, said stabilizer apparatus comprises a first mounting leg fixedly mounted to the first ladder leg, and a second mounting leg mounted to the second ladder leg, and a first extension leg pivotally mounted relative to the first mounting leg, and a second extension leg pivotally mounted relative to the second mounting leg, the first extension leg including a row of first threaded apertures directed therethrough, and the second extension leg including a row of second threaded apertures directed therethrough, the first extension leg arranged parallel relative to the second extension leg, and a first and second anchor leg adjustably secured relative to the first and second extension leg, the first anchor leg including a row of first bore directed therethrough, and the second anchor leg including a row of second bores directed therethrough, and a first fastener directed through one of said first bores and one of said threaded apertures, and a second fastener directed through one of said second threaded apertures and one of said second bores, and a first "L" shaped anchor foot mounted to a forward distal end of the first anchor leg, and a second "L" shaped anchor foot mounted to a forward distal end of the second anchor leg, the first "L" shaped anchor foot including a first anchor foot "L" shaped polymeric friction surface coextensive to an exterior surface of the first anchor foot, and a second anchor foot "L" shaped polymeric friction surface mounted to an coextensive with an exterior surface of the second "L" shaped anchor foot, and first adjustment means mounted to the first mounting leg and the first extension leg to effect adjustment of the first mounting leg relative to the first extension leg, and second adjustment means mounted to the second mounting leg and the second extension leg for adjustment of the second extension leg relative to the second mounting leg.

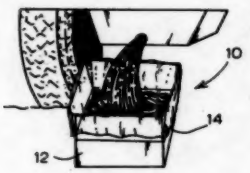
5,180,033
RECYCLABLE OIL CHANGE APPARATUS
Gary Wilson, 1717 SW. Park, Portland, Oreg. 97201
Continuation of Ser. No. 512,031, Apr. 13, 1990, abandoned, which is a continuation of Ser. No. 313,873, Feb. 23, 1989, abandoned. This application Nov. 14, 1991, Ser. No. 794,291
Int. Cl.[5] F16N *31/00*
U.S. Cl. 184—1.5 **3 Claims**

1. Apparatus for changing and recycling used motor oil comprising:

a stiff outer container having a closeable opening that is

substantially coextensive with the top of the outer container, the outer container having substantially continuously extending bottom and sides, an upper extent of the sides being moveable inwardly to substantially completely close the opening, wherein the opening of the outer container is formed by the upright positioning of plural movable flaps that form the upper extents of the sides of the outer container;

a flexible inner container for containing used motor oil, the inner container having a marginal edge dimensioned to provide an opening that is substantially coextensive with the opening of the outer container, the inner container being nested within the outer container thereby to line the inner surface of the outer container, the marginal edge of the inner container being dimensioned also to extend over and around thus temporarily to fix the flaps of the outer container in an upright position, thereby temporarily to increase the effective height of the sides of the outer container having the inner container nested therein with its marginal edge extending thereover to provide margin



against spillage or splatter of oil being drained into the inner container, the inner container being formed of an oil-impervious material, the inner container being closeable to contain the oil by gathering its marginal edge, with such closing of the inner container releasing the flaps of the outer container from their temporarily fixed upright position; and

a tie device for sealingly closing the inner container adjacent the marginal edge when the marginal edge is gathered,

the inner container cooperating with the tie device to sealingly contain motor oil drained into the opening of the inner container nested in the outer container and the flaps of the outer container being movable out of their temporarily fixed upright position into a closed position of containment of the sealingly closed inner container of drained oil for recycling of the motor oil and said apparatus as a unit,

wherein the inner container is formed of a material capable of withstanding temperatures of greater than approximately 250° F.

5,180,034

ADAPTIVE LUBRICATION OIL SYSTEM

William F. Lopes, Groton, Mass., assignor to General Electric Co., Schectady, N.Y.

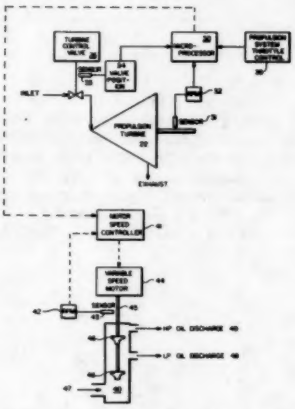
Filed Dec. 6, 1990, Ser. No. 624,698
Int. Cl.[5] F01M *9/00*
U.S. Cl. 184—6.1 **11 Claims**

1. A lubrication system for a turbomachine propulsion system including a lubricated bearing comprising:

a variable speed pump for pumping lubricant at various flow rates through said lubrication system;

a motor speed controller varying the speed of said pump to change the lubricant flow rate; and

a system controller operatively coupled to said motor speed controller, said system controller producing a desired speed signal in response to at least one input signal indicative of the operating condition of said turbomachine propulsion system, said system controller sending said desired speed signal to said motor speed controller to vary the speed of said pump, and said pump varying the flow rate



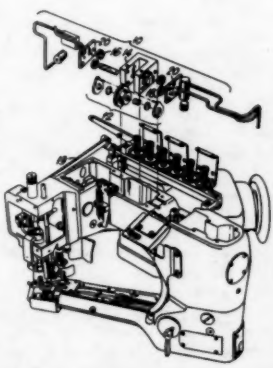
of the lubrication through said bearing in response to said motor speed controller.

5,180,035

OIL PUMPS FOR SEWING MACHINES

Robert Gaudlitz, Cary, Ill., assignor to Union Special Corporation, Chicago, Ill.

Division of Ser. No. 578,885, Sep. 7, 1990, Pat. No. 5,099,774.
This application Nov. 22, 1991, Ser. No. 796,330
Int. Cl.[5] F01M *1/00*
U.S. Cl. 184—6.15 **3 Claims**



1. An adjustable gear hub assembly, comprising:

a housing;

a gear shaft running through said housing;

a spur gear located on said gear shaft within said housing for driving at least one gear pump;

a gear hub connected to said spur gear within said housing for securing said spur gear to said gear shaft;

an adjusting sleeve located within said housing for facilitating adjustment of said adjustable gear hub assembly;

at least one washer located within said housing and having a dog extending inwardly toward said spur gear for engaging said spur gear to provide for a one-to-one rotation of said washer with respect to said spur gear;

at least one oil seal ring located within said housing capable

of elastic deformation to provide a tight fit between said at least one washer and said housing.

5,180,036

CAM OPERATED RAIL CLAMPING DEVICE

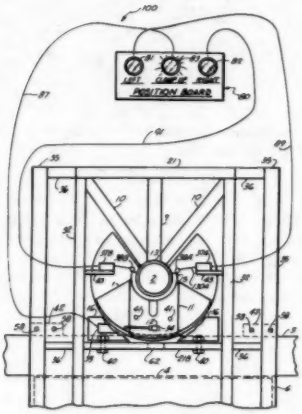
Ronald J. Boben, 503 N. Ingleside, Fairhope, Ala. 36532

Continuation-in-part of Ser. No. 582,669, Sep. 14, 1990, Pat. No. 5,046,588. This application Aug. 29, 1991, Ser. No. 752,086

The portion of the term of this patent subsequent to Sep. 10, 2008, has been disclaimed.

Int. Cl.[5] F16D *66/00*; B61H *7/12*; B61K *7/16*

U.S. Cl. 188—1.11 **9 Claims**



1. A cam operated rail clamping device for preventing movement of a structure on a rail, comprising:

(a) a base;

(b) a vertically disposed post secured to and projecting upwardly from said base;

(c) a tubular member rotatably and slidably mounted on said post;

(d) means for raising said tubular member;

(e) a vertically disposed beam extending upwardly from said base and secured thereto;

(f) a horizontally disposed flange secured to the lower end of said tubular member;

(g) a clamping jaw carried by said flange and provided with a high point and a plurality of teeth for engagement with a first side of said rail, said flange being mounted for rotation about said post to bring said high point of said jaw into wedging action with said first side of said rail when said flange engages a top portion of said rail;

(h) means carried by said base for engagement with a second side of said rail;

(i) means for positioning said clamping jaw in a lowered operative position and raised inoperative position; and,

(j) means for indicating the rotational position of said clamping jaw about said post when said clamping jaw is in said lowered operative position, said means for indicating the rotational position of said clamping jaw comprises second and third indicator lamps, said second indicator lamp being energized when said structure moves in one direction on said rail and said third indicator lamp being energized when said structure moves in the opposite direction.

5,180,037

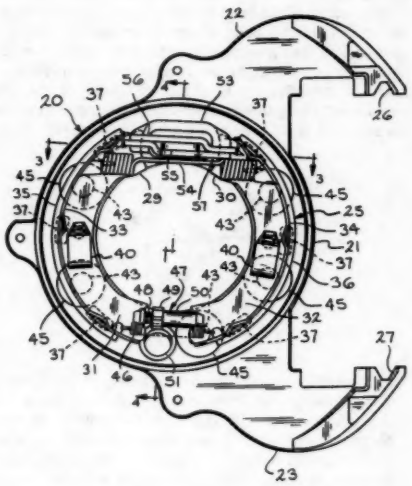
DRUM-IN-HAT PARKING BRAKE FOR A DISC BRAKE ASSEMBLY

Anthony C. Evans, Northville, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Continuation of Ser. No. 400,218, Aug. 29, 1989, abandoned. This application Mar. 26, 1991, Ser. No. 668,370

Int. Cl.[5] F16D *63/00*

U.S. Cl. 188—70 R **12 Claims**



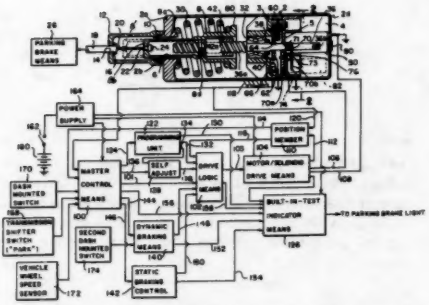
1. In a drum type mechanical parking brake assembly having a backing plate, a central opening therein for passage of an axle, a pair of opposed arcuate brake shoes mounted on an outboard side of said backing plate each having a web with an arcuate outer edge and an arcuate table secured to said outer edge of said web, and a pair of friction pads secured to said tables, the improvement comprising a hollow, rotation-preventing abutment post disposed upon said backing plate between adjacent ends of said brake shoe webs, said abutment post forming a chamber extending inboard through said backing plate and having means for engagement respectively therein of said brake shoe webs, a generally flat elongated upper link and a generally flat elongated lower link in flatwise partially contiguous relationship, said upper link having an offset end and said lower link having an offset end opposite from said offset end of said upper link lengthwise of said links whereby intermediate portions of said links are spaced apart, an outboard face of said abutment post having slots for reception respectively therein of opposite ends of said links and said opposite ends of the links having slots for reception respectively therein of said brake shoe webs, a pivotable operating lever disposed in said chamber having a cable attacked to an inboard end thereof and having an outboard end disposed in a space between said intermediate portions of the links, a hat-shaped disc brake rotor concentrically associated with said backing plate on an outboard side thereof and including a hat engageable on an inner cylindrical surface by said friction pads, said links being operatively connected to said lever respectively at points spaced along said lever whereby pivotably movement of said lever by said cable effects lengthwise extension of said links in opposite direction thereby urging said friction pads into frictional engagement with said hat.

5,180,038

ELECTRONICALLY CONTROLLED PARKING BRAKE SYSTEM

James H. Arnold, Huntsville; Randal J. Perisho, Moberly; Michael D. DeWitt, and Wayne L. Soucie, both of Columbia, all of Mo., assignors to Orscheln Co., Moberly, Mo.

Filed Jan. 24, 1992, Ser. No. 825,503
Int. Cl.[5] B60T 13/04
U.S. Cl. 188—171 10 Claims



1. An electronically controlled parking brake system for tensioning the parking brake cable of a vehicle, comprising:

(a) a housing (2) adapted for connection with the vehicle, said housing containing a longitudinally extending chamber;

(b) a movable member (8) mounted for longitudinal movement within said chamber, said movable member being adapted for connection at one end with the parking brake cable;

(c) main spring means (30) normally biasing said movable member in one direction relative to said housing toward a brake-engaged position;

(d) drive means including an electric motor (50) for driving said movable member in the opposite direction relative to said housing toward a brake-released position, said drive means including;

(1) a drive screw (36) longitudinally arranged within the chamber of, and rotatably connected with, said housing;

(2) a drive nut (42) threadably mounted on said drive screw; and

(3) means (42*a*) connecting said drive nut with said movable member;

(e) retaining means (70) normally retaining said movable member in said brake-released position, said retaining means including a helical clutch spring (70) mounted concentrically about, and having turns normally biased radially inwardly into engagement with the outer periphery of, said drive screw, said clutch spring being arranged to permit rotation of said drive screw in the brake-releasing direction, but to prevent rotation of said drive screw in the opposite direction, said clutch spring having at each end a radially outwardly extending leg portion a first one of which is connected with said housing; and

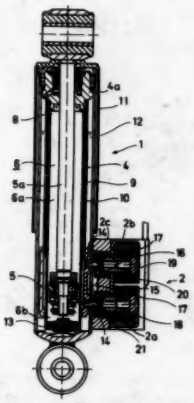
(f) release means for (74) releasing said retaining means, said release means being operable to displace the other of said spring leg portions relative to said first leg portion in a direction to expand said clutch spring turns, thereby to release said drive screw relative to said housing and to permit said main spring means to return said movable member to its brake applied position.

5,180,039

FLUID PASSAGE UNIT

Ludwig Axthammer, Hambach, and Felix Wössner, Schweinfurt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Continuation of Ser. No. 545,918, Jun. 28, 1990, abandoned.
This application Jul. 2, 1992, Ser. No. 908,830
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1989, 3922155
Int. Cl.[5] F16F 9/46
U.S. Cl. 188—299 22 Claims



1. A fluid passage unit comprising means (2*c*) defining a fluid channel system (14, 21*a*, 15) and an electromagnetically operated valve system (2*a*) allocated to said fluid channel system (14, 21*a*, 15) for controlling fluid flow through said fluid channel system (14, 21*a*, 15) in at least one flow direction, said valve system (2*a*) comprising an annular valve unit (23) having an axis, a passage therethrough, and two axially spaced, substantially oppositely directed annular sealing areas (23*a*, 25) substantially coaxial with said axis, a first one (23*a*) of said annular sealing areas (23*a*, 25) being sealingly engageable with an annular first counter-sealing area (22) of a valve seat member (21) surrounding a fluid channel (14), a second one (25) of said annular sealing areas (23*a*, 25) being sealingly engageable with a second counter-sealing area (24) of a counter-sealing member (18) movably guided substantially along said axis with respect to said valve seat member (21), movement of said counter-sealing member (18) substantially along said axis being controllable by electromagnetic control means (17),

said annular valve unit (23) having a radial play with respect to said valve seat member (210 such that said first annular sealing area (23*a*) of said annular valve unit (23) and said annular first counter-sealing area (22) of said valve seat member (21) have freedom of a substantially radial relative displacement while maintaining sealing engagement thereof and while maintaining a substantially constant orientation of said annular valve unit (23) with respect to said valve seat member (21),

at least one (24) of said second sealing area (25) and said second counter-sealing area (24) being a spherically shaped face (24) having a center close to said axis and defining with the other (25) of said second sealing area (25) and said second counter-sealing area (24) a ball-type spherical seal, such that said second sealing area (25) and said second counter-sealing area (24) maintain sealing engagement with one another even when said counter-sealing member (18) and said annular valve unit (23) are axially tilted relative to each other,

said annular valve unit (23) being in sealing engagement by said first and second annular sealing areas (23*a*, 25) with both said annular first counter-sealing area (22) and said

second counter-sealing area (24) when said counter-sealing member (18) is in a terminal position close to said valve seat member (21).

5,180,040

AUTOMATIC ELECTRIC CARD REWINDING APPARATUS WITH CONTACTS FOR SUPPLYING ELECTRIC POWER

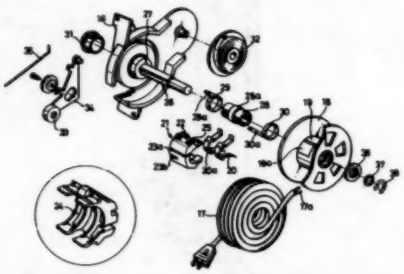
Heon Pyeong Ji, Busan, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 29, 1991, Ser. No. 737,226

Claims priority, application Rep. of Korea, Jul. 31, 1990, 11312/1990

Int. Cl.[5] H02G *11/02*

U.S. Cl. 191—12.2 R **4 Claims**



1. An automatic electric cord reel rewinding apparatus with contacts for supplying electric power comprising:

a terminal body having a pair of vertical depressions at an inner surface spaced apart from each other and a pair of grooves at an outer surface, each said vertical depression including a pair of openings at both ends;

a pair of bow-shaped contact terminals having a pair of snap projections at both ends of an angulated part of said contact terminal and being secured in said vertical depressions of the terminal body respectively, said snap projections being secured into said openings of said vertical depressions by a snap type fit, lead wires of an electric cord being connected to said bow-shaped contact terminals via said grooves;

a winding wheel provided with an opening adapted to receive and support said terminal body;

a housing provided with a shaft inserted into said winding wheel in order to rotatably support said winding wheel;

an annular body inserted onto said shaft of the housing and divided into two parts by means of an annular rib integrally formed with said annular body; and

a pair of conduction rings inserted onto said parts of the annular body, respectively, whereby said bow-shaped contact terminals each contact one of sad conduction rings.

5,180,041

CURRENT COLLECTING APPARATUS FOR TRANSPORT VEHICLE

Masamoto Shuto, Tokyo, Japan, assignor to HSST Corporation, Tokyo, Japan

Filed Nov. 25, 1991, Ser. No. 797,215

Claims priority, application Japan, Nov. 27, 1990, 2-324587

Int. Cl.[5] B60L *5/39*

U.S. Cl. 191—53 **8 Claims**

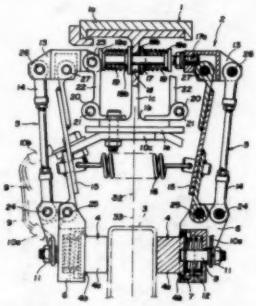
1. A current collecting apparatus for a transport vehicle comprising:

a mounting member fixed to said transport vehicle through an insulator,

a couple of support arms with first ends thereof rotatably supported to said mounting member and positions thereof made symmetrical to a center line of said mounting member parallel to the longitudinal direction of said transport vehicle,

a couple of collector shoe holders each rotatably connected to second ends of each of said support arms and

a couple of collector shoes each slidably supported in each



of said collector shoe holders together with a spring which presses each of said collector shoes toward said center line whereby each of said collector shoes comes in contact with opposite side surfaces of a trolley rail installed on a track and connected to an electric power source.

5,180,042

TORQUE TRANSMISSION CONTROL DEVICE

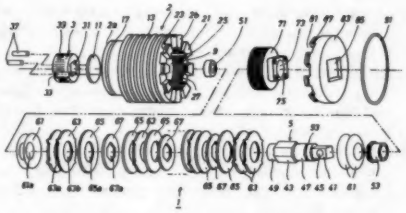
Kenji Ogiso, Nagoya, Japan, assignor to Mighty Engineering Inc., Japan

Filed Aug. 21, 1991, Ser. No. 748,033

Claims priority, application Japan, Mar. 26, 1991, 3-18584[U]

Int. Cl.[5] F16D *43/20*

U.S. Cl. 192—56 R **13 Claims**



1. A torque transmission device comprising

coaxial rotatable input and output members interconnected by a torque transmitting clutch resiliently biased into engagement to transmit torque from the input to the output member, means for adjusting the resilient bias of the clutch to limit maximum torque transmission by the clutch to an adjustable desired maximum value and releasable retaining means for retaining a desired maximum torque transmission limit during the transmission of torque from the input to the output member;

a housing having a first end and a second end, the first end defining a cylindrical cavity with the output member therein and means at the second end for connection to a rotary power source;

wherein the means for adjusting the resilient bias of the clutch to limit maximum torque transmission to a desired maximum value is a pressure adjusting member located in the opening of the housing;

the pressure adjusting member has a bore which accommodates the output member; and

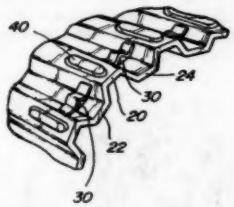
the pressure adjusting member has an axial projection extending outwardly from the housing with the bore extending therethrough.

5,180,043

SPLINED ASSEMBLY

Herman B. Walker, Rochester, Mich., assignor to Koppy Corporation, Orion, Mich.

Filed Feb. 20, 1992, Ser. No. 839,513
Int. Cl.[5] F16D *13/62*
U.S. Cl. 192—70.2 **2 Claims**



1. A housing assembly comprising:

a snap ring;

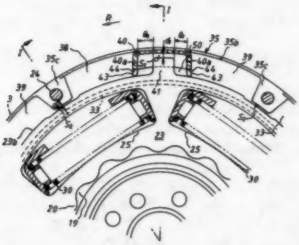
an annular body having a plurality of splines, a lanced slot formed in a root section of each of said plurality of splines, each of said slots receiving said snap ring, said body further having a groove portion formed between each pair of adjacent splines, and an outwardly projecting portion formed on an outer peripheral surface of each groove portion, wherein said projecting portions structurally strengthen said housing assembly in a vicinity of each of said lanced slots.

5,180,044

LIQUID VISCOUS DAMPER

Hirotaka Fukushima, and Mitsuhiko Takenaka, both of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

PCT No. PCT/JP90/01586, § 371 Date Aug. 21, 1991, § 102(e) Date Aug. 21, 1991, PCT Pub. No. WO91/10078, PCT Pub. Date Jul. 11, 1991
PCT Filed Dec. 17, 1990, Ser. No. 721,654
Claims priority, application Japan, Dec. 22, 1989, 1-148314
Int. Cl.[5] F16D *3/80*
U.S. Cl. 192—106.1 **1 Claim**



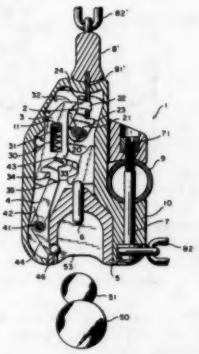
1. A liquid viscous damper in which an output-side driven plate and an input-side drive plate housing the foregoing driven plate by covering both sides and outer peripheral side of the foregoing driven plate are installed, a damper mechanism for developing a torisonal torque is installed in between the both plates, a liquid chamber is formed between the drive and driven plates and filled with liquid, the liquid chamber is partitioned into circumferential front and rear divided-chambers, and the divided chambers are connected by chokes; a main choke, characterized by projections formed on the outer periphery of the driven plate and protruding into the liquid chamber, a slider is fitted onto the drive plate in such a manner as slidable in a rotational direction, a main choke is formed between the slider and the projection, stoppers above to mate with the projection at circumferential both ends of the slider are formed with spaces left between them in the rotational direction, and a sub-choke connecting the divided chambers is formed separately from the main choke.

5,180,045

SECURING DEVICE FOR CARTS

Horst Sonnendorfer, and Franz Wieth, both of Eichenau, Fed. Rep. of Germany, assignors to SYSTEC Ausbausysteme GmbH, Eichenau, Fed. Rep. of Germany

Filed Nov. 15, 1990, Ser. No. 612,683
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1990, 4023396
Int. Cl.[5] G07F *5/02*
U.S. Cl. 194—212 **6 Claims**



1. A securing device (**11**) for carts having:

a chain (**82**) with a first end secured to a screw (**7**) mounted on a cart,

a first key secured to a second end of said chain (**82**),

coin receiving means for releasing and retaining an introduced coin (**50, 51**),

means engaged to said coin receiving means for coupling and uncoupling said cart to and from another parked cart,

wherein a second key (**8'**) secured to said other parked cart is introduced into said securing device (**1**) to couple and securely hold said cart to said other parked cart,

wherein introducing said second key (**8'**) further releases a coin (**50, 51**) retained in said coin receiving means of said cart and

wherein said cart can be uncoupled from said other parked cart by introducing a next coin (**50, 51**) into said coin receiving means thereby releasing said second key (**8'**) while said next coin (**50, 51**) is retained in said coin receiving means,

said means engaged to said coin receiving means for coupling and uncoupling comprising:

a pivotable locking part (**2**) for lockingly engaging said second key (**8'**),

a spring returned part (**3**) biased toward said coin receiving means for maintaining said locking part (**2**) in engagement with said second key (**8'**) and releasing said next coin,

wherein introduction of said second key (**8'**) causes said second key to engage and pivotably urge said locking part (**2**) into locking engagement with said second key (**8'**) and permits said spring returned part (**3**) to move toward said coin receiving means, releasing said next coin and engag-

ing said locking part (2) to maintain said locking part (2) in locking engagement with said second key (8').

5,180,046

COIN DISCRIMINATION APPARATUS

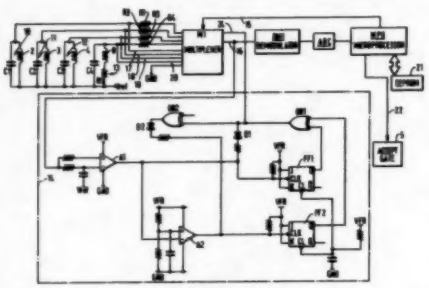
Les Hutton, 5 Weir Road, Milnrow, Rochdale, Lancashire, and John Kershaw, 84 Haven Lane, Moorside, Oldham Lancashire, OL4 2QH, both of England

Filed Feb. 26, 1991, Ser. No. 661,487

Claims priority, application United Kingdom, May 24, 1990, 9011683

Int. Cl.[5] G07D *5/08*

U.S. Cl. 194—319 8 Claims



1. Coin discrimination apparatus comprising:

means defining a path for passage of coins under test;

sensor coil means for forming an inductive coupling with coins under test during their passage along the path, said sensor coil means being connected in a resonant circuit which exhibits a resonant frequency that varies in dependence upon the inductive coupling between the coil and coin;

control means for maintaining the resonant circuit at the resonant frequency whilst a coin under test is inductively coupled to said coil means; and

amplitude responsive means responsive to the change in the amplitude of an oscillatory signal developed by the resonant circuit when the coin under test passes the sensor coil means, wherein the control means includes threshold detecting means responsive to the oscillatory signal crossing a given threshold level for producing a rectangular waveform corresponding to said oscillatory signal, and drive means responsive to said rectangular waveform for driving the resonant circuit to maintain resonance, said drive means including bistable circuit means having first and second stable states and being configured to be clocked between said states in response to said rectangular waveform, and means for feeding back the output of said bistable circuit means for modifying the rectangularity of said rectangular waveform.

5,180,047

BALUSTRADE AND DECK MOUNTING ASSEMBLY FOR ESCALATOR OR MOVING WALKWAY

Dale R. Barrett, Berlin; Dat Nguyen, New Britain, and Frank M. Sansevero, Glastonbury, all of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 7, 1992, Ser. No. 864,755

Int. Cl.[5] B66B *23/22*

U.S. Cl. 198—335 4 Claims

1. A balustrade and deck mounting assembly for escalators or moving walkways, said assembly comprising:

a) a plurality of first anchor brackets secured to a truss member on the escalator or moving walkway outboard of the escalator or moving walkway steps;

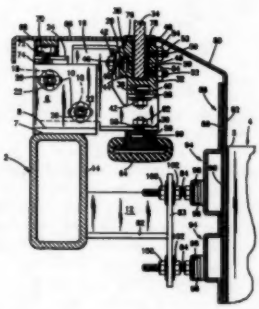
b) a template bracket mounted on each of said anchor brackets, said template brackets being positionally adjustable relative to said anchor brackets for ensuring proper location of each element mounted on said template brackets;

c) a balustrade support channel mounted on said template brackets for receiving the lower edge portion of a glass balustrade;

d) an inner deck panel connected to said balustrade support channel, said deck panel depending from said support channel toward said steps;

e) an outer deck panel connected to said support channel, said outer deck panel extending away from said steps, and said outer deck panel being secured to each of said template brackets;

f) handrail return guide means mounted on said template brackets for guiding return movement of a handrail, said handrail return guide means being positioned at approximately the same level as tread portions of said steps;



g) a plurality of second anchor brackets secured to said truss member at locations below said handrail return guide means, said second anchor brackets extending toward said steps;

h) a skirt panel assembly positioned adjacent to said steps and said inner deck panel;

i) adjustable mounting means connected to said second anchor brackets and to said skirt panel assembly for positioning and holding said skirt panel assembly in a properly spaced relationship with respect to said steps; and

j) removal of said inner deck panel from the mounting assembly providing clear unimpeded access to said balustrade support channel, said handrail and handrail return guide means, and said adjustable mounting means whereby installation, service and repair of the handrail, balustrade support channel and adjustable mounting means is facilitated.

5,180,048

MAGNETIC LEVITATING TRANSPORTATION SYSTEM

Noriyuki Kawada; Shigeki Morii; Motomi Nakashima; Jin Yamada, and Akitami Kaneko, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1991, Ser. No. 736,458

Claims priority, application Japan, Oct. 12, 1990, 2-274412; Mar. 4, 1991, 3-37177; Mar. 20, 1991, 3-56807

Int. Cl.[5] B65G *35/00*

U.S. Cl. 198—619 15 Claims

1. A magnetic levitating transportation system comprising:

(a) a first electromagnet array;

(b) a second electromagnet array, said first and said second arrays comprising a plurality of coils, said coils having an outer side, said arrays forming a first parallel electromagnet array, said first parallel array having an inner distance between said coils of said first and second arrays, an outer distance measured from the outer side of said coils of said

first and second arrays, and an electromagnetic pitch measured between adjoining coils of said first array;

(c) means for generating an alternating magnetic field in said first parallel array;

(d) a conductive paramagnetic metal body for levitating above said first parallel array, said body comprising:

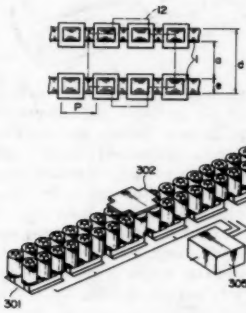
(1) a central portion comprising:

(i) a longitudinal axis;

(ii) longitudinal sides, said sides being parallel to said axis;

(iii) first and second ends, said ends being perpendicular to said axis and connecting said sides;

(iv) a first width, A, between said sides, governed by the relationship, $a<A<d$, wherein a represents said inner distance and d represents said outer distance; and,



(v) a first length, C, between said first and second ends, said first length being governed by the relationship $C \geq 2(P)$, wherein P represents said electromagnetic pitch; and,

(2) projected portions, symmetrically attached to said sides comprising:

(i) an outer side parallel to said axis;

(ii) third and fourth ends, said third and fourth ends connecting said outer side to one of said longitudinal sides, and being perpendicular thereto;

(iii) a second width, D, between said outer side and one of said longitudinal sides, said second width being governed by the relationship $D>(d-A)/2$; and

(iv) a second length, B, between said third and fourth ends, said second length being governed by the relationship $B \geq P$.

5,180,049

DEVICE FOR SUPPORTING AND TRANSPORTING A METAL SHEET IN RELATION TO A WORKSTATION AT WHICH THE METAL SHEET IS TO BE PUNCHED AND/OR SHEARED

Guido Salvagnini, Sarego, Italy, assignor to Salvagnini S.p.A., Sarego, Italy

Filed Oct. 21, 1991, Ser. No. 779,850

Claims priority, application Italy, Oct. 22, 1990, 21819 A/90

Int. Cl.[5] B65G *15/42*

U.S. Cl. 198—699.1 **5 Claims**

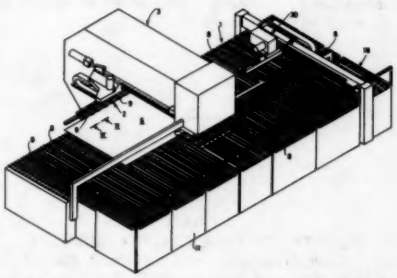
1. A device for supporting and transporting a metal sheet in relation to a workstation at which the metal sheet is to be processed by being subjected to at least one of punching and shearing,

said device comprising:

a supporting plane for the metal sheet, including:

a plurality of tubular metal sections horizontally arranged side by side, said sections being configured and secured relative to one another so as to define between respective adjoining ones of said sections respective upwardly opening spaces extending lengthwise of the respective sections; and

a plurality of bristle bars, each bristle bar comprising a row of bristle tufts having flexible bristles arranged with tips upward and bases downward, for each said row said bases being embedded in a respective supporting



strip; each said supporting strip being removably jammingly secured in a respective said upwardly opening space so as to extend lengthwise of the respective sections, with said bristle tufts projecting upwardly so that said tips of said bristles, while undeflected, provide a generally horizontal, upwardly presented though discontinuous supporting surface.

5,180,050

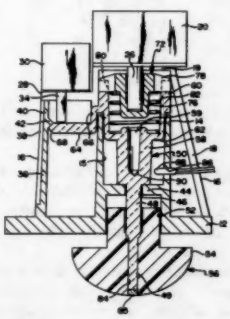
PUSHBUTTON ROTARY SWITCH

Mark Z. Rada; John W. Willis; John A. Eade, and Charles E. Kidwell, all of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Oct. 15, 1991, Ser. No. 775,392

Int. Cl.[5] H01H *3/00, 9/00*

U.S. Cl. 200—329 **10 Claims**



8. A switch assembly operable by pushbutton and/or rotary input motion comprising:

a housing having a bore defining an axis; actuator means mounted in the bore for rotary and axial movement;

a rotary switch mounted on the housing and aligned with the said axis, and including an actuation shaft aligned with said axis;

means for rotatably coupling the actuator means and the rotary switch for actuation of the rotary switch upon rotation of the actuator means including an axial lost motion device engaging the shaft for imparting rotation to the shaft;

pushbutton switch means mounted on the housing at a location laterally offset from the axis; and the actuator means including a radial extension reaching the pushbutton

switch for actuation of the pushbutton switch upon axial translation of the actuator means;

wherein the axial lost motion device comprises:

a tubular end portion on the actuator means proximate to the rotary switch and concentric with the shaft; and

key means axially slidable in the tubular end portion and drivingly attached to the actuation shaft and to the tubular end portion for transmitting rotary motion from the actuator means to the actuation shaft.

5,180,051

REMOTE CONTROL CIRCUIT BREAKER

Robert G. Cook, Westchester, Ohio; Daniel J. Runyan, Hickman, Nebr.; Willard J. Rezac, Cedar Rapids, Iowa; Thomas A. Edds, Cedar Rapids, Iowa, and Ronald J. Bilas, Cedar Rapids, Iowa, assignors to Square D Company, Palatine, Ill.

Filed Jun. 28, 1991, Ser. No. 722,050

Int. Cl.[5] H01H *5/00, 5/23, 3/40*

U.S. Cl. 200—400 **16 Claims**

1. A remotely controllable circuit breaker device for interrupting power in a circuit path between a source and a load, comprising:

a first contact and a second contact cooperatively arranged in the circuit path, and within a housing, so as to provide current from the source to the load and at least one of the contacts being movable for interrupting the power provided to the load;

gear driving means, responsive to open control and closed control signals generated from a remote location, for moving said at least one movable contact so that the circuit path is interrupted and established, respectively;

a rotatable gear which connects to and responds to said gear driving means, said rotatable gear being mounted to said device on a pivot and being integrally formed with a coupling pin which is coupled to said at least one movable contact so that the circuit path is interrupted in response to said control signal; and

a one-piece coupling arm secured at one end to said at least one movable contact, another end of said coupling arm being integrally formed with a lost motion cam, said cam having an elongated slot formed therein to engage said coupling pin and provide a gap between said coupling pin and the coupling arm when the contacts are closed, whereby the contacts are not prevented from closing even when the contacts are worn.

5,180,052

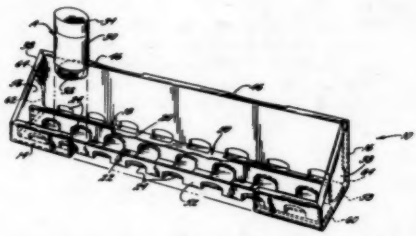
DISPLAY TRAY

Raymond D. Smith, Cincinnati, and Janet A. Reckers, Loveland, both of Ohio, assignors to Chesapeake Display and Packaging Company, Winston Salem, N.C.

Filed Sep. 6, 1991, Ser. No. 756,152

Int. Cl.[5] B65D *23/12*

U.S. Cl. 206—45.11 **13 Claims**



1. A display tray comprising a tray body having a bottom wall, opposing front and rear walls and an open top, at least one support wall spaced between front and rear walls forming a plurality of article carrying rows and extending upward from the bottom wall to define a plurality of article carrying rows, and a plurality of openings positioned in the front, rear and support walls adjacent the bottom wall for receiving projections of articles to be carried in the display tray and retaining the articles in the article carrying rows wherein said rear wall is substantially equal to the height of the articles to be carried within the display tray and substantially higher than the front wall.

5,180,053

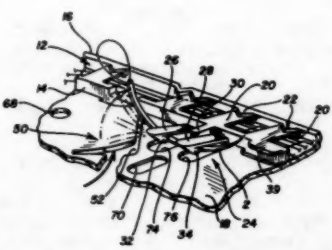
CANTILEVERED NEEDLE PARK

Jack Cascio, Bridgewater; Konstantin Ivanov, Dunellen; Marvin Alpern, Glen Ridge, all of N.J.; Robert Cerwin, Pipersville, Pa., and Joseph Siernos, Whitehouse Station, N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Feb. 28, 1992, Ser. No. 843,138

Int. Cl.[5] A61B *17/06*

U.S. Cl. 206—63.3 **11 Claims**



1. A needle park for securing a needle, comprising

a generally planar base,

an elongated arm that, having a first end secured in a fixed relationship to the base and a second end that is free, extends in a direction generally parallel to the base, and

a nib that extends toward the base from a point near the free end of the arm.

5,180,054

WRAP-AROUND CARTON WITH END CLOSURE PANELS

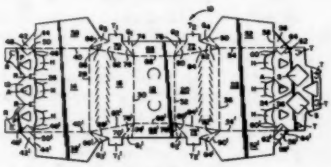
Martinus C. M. Bakx, Roosendaal, Netherlands, assignor to The Mead Corporation, Dayton, Ohio

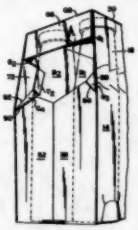
Filed Mar. 11, 1991, Ser. No. 667,163

Claims priority, application United Kingdom, Mar. 8, 1990, 9005223

Int. Cl.[5] B65D *75/00*

U.S. Cl. 206—140 3 Claims





1. A carton of the wraparound type for bottles which carton comprises top and bottom panels connected together by spaced side wall panels thereby forming a tubular structure, and a set of end panels at each end of the tubular structure at least partially to close the ends of the carton, each said set comprising a pair of lower end closure panels hinged to respective ones of the side wall panels and folded so as to extend across that end of the tubular structure towards one another to close a lower part of said end and an upper end panel hinged to the top panel of the carton and folded downwardly at least partially to complete the closure of the upper part of said end, said upper end panel and each of said lower end closure panels are connected by a retaining panel which extends sufficiently internally of the tubular structure to permit it to be tucked between the endmost articles and the respective side wall panels adjacent thereto so as to maintain said upper end panel and said lower end closure panels in position.

5,180,055

METHOD OF ATTACHING TWO HALF-CARTONS AND THE PRODUCT

Christopher N. Chance, Richmond; James A. DeBlasio, Midlothian; Donald H. Evers, Richmond; William C. Harris, Jr., Midlothian; Michael A. Kirby, Sr., Trevilians; Reginald W. Newsome, Richmond, and Robert E. Talley, Chester, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 774,529, Oct. 8, 1991, Pat. No. 5,141,106. This application Jun. 22, 1992, Ser. No. 901,677

Int. Cl.[5] B65D *5/00, 85/10*; B65B *51/08*

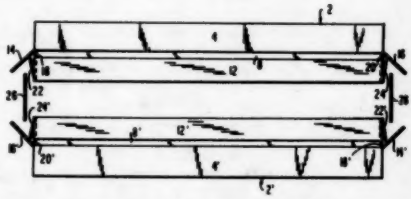
U.S. Cl. 206—256 15 Claims

1. A method of packaging two containers, comprising the steps of:

forming two substantially identical containers, each container having a front wall, two side walls and two side flaps;

forming a dual container structure by positioning the two containers so that the front wall of one container abuts the front wall of the other container;

placing a releasable attachment means at an end of the dual container structure at least partially between the side flap and side wall of each container; and



permanently adhering the side walls of each respective container to the side flaps of each respective container while releasably securing the releasable attachment means to at least one of (a) the side walls and (b) the side flaps.

5,180,056

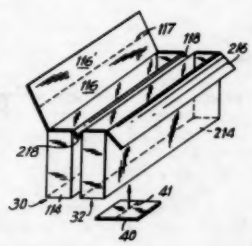
DUAL CARTON

John M. Adams, Mechanicsville; Christopher N. Chance, Richmond; James A. DeBlasio, Midlothian; Donald H. Evers, Richmond; Michael A. Kirby, Sr., Trevilians; Reginald W. Newsome, Richmond, and Robert E. Talley, Chester, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 774,529, Oct. 8, 1991. This application Feb. 3, 1992, Ser. No. 829,375

Int. Cl.[5] B65D *85/10, 5/54*

U.S. Cl. 206—256 47 Claims



1. A dual carton comprising:

a first carton second ends, a first pair of first and second opposed walls, and a second pair of third and fourth opposed walls; each said first, second, third, and fourth wall having a first edge adjacent said first end and a second edge adjacent said second end;

a first extension panel extending from said first edge of said first wall and having a distal edge which lies adjacent said first edge of said second wall when said first extension panel is folded substantially perpendicular to said first wall, towards said second wall;

a second extension panel extending from said first edge of said second wall and having a free edge; and

a third extension panel extending from said distal edge of said first extension panel and having a free edge; said dual carton further comprising:

a second carton having first and second ends, a first pair of first and second opposed walls, and a second pair of third and fourth opposed walls; each said first, second, third, and fourth wall having a first edge adjacent said first end and a second edge adjacent said second end; said second carton further comprising:

a first extension panel extending from said first edge of said first wall and having a free edge; and

a second extension panel extending from said first edge of said second wall and having a free edge; wherein:

said first and second cartons are positioned adjacent one

another with said second wall of said first carton adjacent and coextensive with said second wall of said second carton such that the borders of said coextensive walls are aligned to form said dual carton; and

said third extension panel of said first carton extends between said first edges of said first and second walls of said second carton when said first and third extension panels of said first carton are folded towards said second carton such that said second carton may be joined to said first carton to form said dual carton by securing said third extension panel to said second carton.

5,180,057

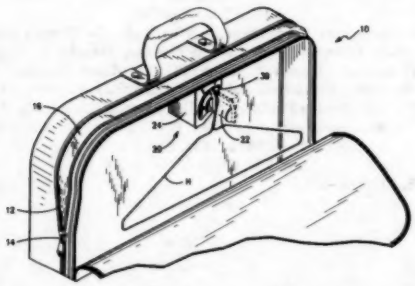
EXPANDABLE GARMENT BAG AND HANGER BAR THEREFOR

Dana Franklin, Denver, Colo., assignor to Samsonite Corporation, Deaver, Colo.

Filed Mar. 15, 1991, Ser. No. 670,121

Int. Cl.[5] A47F *7/24;* **A45C** *7/00, 11/00;* **B65D** *85/18*

U.S. Cl. 206—279 **14 Claims**



1. In a luggage case of the type used to hold garments on hangers, said luggage case including a device for suspending the hangers by engaging the hooked portions thereof, the improvement comprising

a) said device for suspending including

i) bar means over which the hooked portions of hangers may be positioned, said bar means defining a first length from which at least one of said garments on hangers may be hung,

ii) means positioned above said bar means for retaining said hooked portions on said bar means,

iii) means for lengthening said bar means beyond said first length to a second length whereby a greater number of garments on hangers may be accommodated thereon, and

iv) means, carried by said bar means for locking said bar means when it is in said first length and said second length.

5,180,058

EXPANDABLE DISC HOLDER ASSEMBLY

James Hu, Shin-Tien, Taiwan, assignor to Pro Eton Corporation, Taipei, Taiwan

Filed Nov. 25, 1991, Ser. No. 797,207

Int. Cl.[5] B65D *85/57*

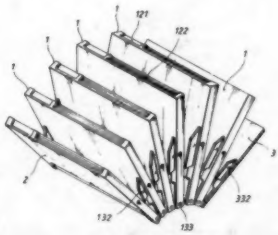
U.S. Cl. 206—309 **3 Claims**

1. An expandable disc holder assembly comprising:

a) a front cartridge including substantially flat inner and outer surfaces, a pair of sidewalls, a top wall, a curved notch formed at a bottom portion of each sidewall, a positioning hole extending through each curved notch, and a rib formed on an inner surface of each sidewall;

b) a back cartridge including substantially flat inner and outer surfaces, a pair of flange elements extending outwardly from the inner surface, each flange element being spaced inwardly from an adjacent side edge of the cartridge to form a stepped portion therewith, each flange element being defined by an upper portion, a lower portion, a flexible portion between the upper and lower portions, a rib extending from an inner side of the flexible portion, a positioning stub extending outwardly from the lower portion, an extension plate connecting the lower portions of the flange elements and spaced from the inner surface, and a straight connecting element extending along the bottom of the extension plate between the lower portions of the flange elements to form a bottom wall;

c) at least one intermediate cartridge including substantially flat first and second surfaces; a pair of sidewalls, a top wall, a curved notch formed at a bottom portion of each sidewall, a positioning hole extending through each curved notch, a rib on an inner surface of each sidewall, a pair of flange elements extending outwardly from the first surface, each flange element being spaced inwardly from an adjacent side edge of the cartridge to form a stepped portion therewith, each flange element being defined by an upper portion, a lower portion and a flexible portion



between the upper and lower portions, a rib formed on an inner side of the flexible portion, a positioning stub extending outwardly from the lower portion, an extension plate connecting the lower portions and spaced from the first surface, and a straight connecting element extending along the bottom of the extension plate between the bottom portions of the flange elements to form a bottom wall; and

d) wherein the front cover may be pivotally secured to the first side of the intermediate cartridge by disposing the positioning stubs of the intermediate cartridge through the positioning holes of the front cartridge and the back cartridge may be pivotally secured to the second side of the intermediate cartridge by disposing the positioning stubs of the back cartridge through the positioning holes of the intermediate cartridge, thereby permitting the front, intermediate and back cartridges to be pivoted between open and closed positions wherein the assembly is in substantially the form of a cylindrical sector when in the open position.

5,180,059

PACKAGE OF SANITARY TAMPON

Sumie Shimatani, and Kazuo Shimatani, both of 109-3 Koyato, Kouza-gun, Kanagawa, Japan

PCT No. PCT/JP89/00385, § 371 Date Oct. 17, 1990, § 102(e) Date Oct. 17, 1990, PCT Pub. No. WO91/04856, PCT Pub. Date Apr. 18, 1991

PCT Filed Apr. 11, 1989, Ser. No. 598,623

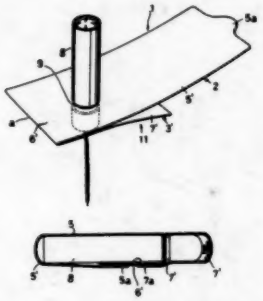
Claims priority, application Japan, Apr. 12, 1988, 63-48867

Int. Cl.[5] B65D *17/06*

U.S. Cl. 206—440 **3 Claims**

1. A package of a sanitary tampon comprising a packing sheet assembly composed of at least one sheet having three sheet parts that are superimposed one upon another to form said package, two of the three sheet parts are folded along a line perpendicular to their edges at a suitable position such that areas of an inner surface of the thus folded two sheet parts face

each other, at least one of said sheet parts includes an aperture juxtaposed said folded line, a sanitary tampon having first and second longitudinal parts with said second longitudinal part extending through said aperture formed through the at least one sheet part at a location near the aforesaid suitable position, said two sheet parts that face each other being separably



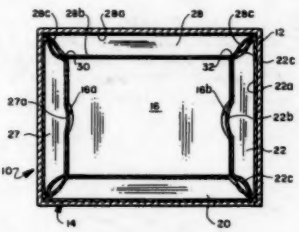
bonded to each other along their facing edges and also at a free end of one of said two sheets to thereby enclose said first longitudinal part of the sanitary tampon, wherein the remaining one of said three sheet parts is folded to enclose the second longitudinal part of the sanitary tampon, said remaining sheet part being separably adhered at its two sides and a free end to an outer surface of one of the aforesaid two sheet parts.

5,180,060

INFLATABLE, ENCAPSULATING PACKAGING INSERT

Ernesto R. Forti, Barrington, and Judith A. Jarvis, Medinah, both of Ill., assignors to Jarvis Chemicals & Paper Company, Addison, Ill.

Filed Jul. 10, 1991, Ser. No. 728,231
Int. Cl.[5] B65D *81/02*
U.S. Cl. 206—522 **29 Claims**



1. An inflatable packaging insert for protecting an article within an enclosed container, said packaging insert comprising:

a first outer sheet and a second inner sheet each comprised of a flexible, gas-impervious material, wherein said first outer sheet is for contacting an inner surface of the container and said second inner sheet is for disposition about and contact with the article;

sealing means for coupling said first and second sheets in a sealed manner to form a plurality of interconnected inflatable chambers; and

valve means for inflating said packaging insert, wherein said second inner sheet comprises gusset means for connecting said second inner sheet to said first outer sheet and for allowing said second inner sheet to uniformly and linearly move away from said first outer sheet during inflation of the packaging insert whereby said second inner sheet securely engages and encapsulates corners and edges of the article in a generally uniform manner.

5,180,061

STABLE IODOPHOR IN POLYURETHANE FOAM

Mohammad A. Khan, Sandy, and Minh Q. Hoang, Taylorsville, both of Utah, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 9, 1991, Ser. No. 756,661
Int. Cl.[5] A61B *19/02*
U.S. Cl. 206—570 **6 Claims**

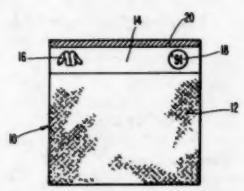
1. A surgical scrub comprising a polyurethane sponge and a germicidal composition impregnated in said sponge, said composition comprising iodine, iodide, a polar vehicle and at least 12% of a nonionic surfactant when the composition if essentially water free and at least 21% of said nonionic surfactant when the composition includes water.

5,180,062

FABRIC MATCH METHOD AND SET

Nancy J. Stables, 16795 Mellen La., Jupiter, Fla. 33478

Filed Jan. 6, 1992, Ser. No. 817,454
Int. Cl.[5] B65D *71/00*; B44D *3/00*
U.S. Cl. 206—574 **7 Claims**



1. A set comprising a first card and a container for use in matching clothing with other articles, comprising:

said first card having a swatch of fabric in engagement therewith; and indicia on said first card indicating the article of clothing made from the fabric; and said container adapted and configured to receive and contain said first card therein; said container having a plurality of spaces defined by index cards; said index cards having indicia thereon corresponding to the indicia on said first card such that said first card may be placed in one of the spaces defined by the index cards for retrieval.

5. A method of matching clothing to other articles, comprising:

providing a tag for association with said clothing;

providing a swatch of the material from which the clothing was made;

engaging said swatch with said tag;

providing indicia on said tag indicating the type of clothing to which said tag will be attached;

detachably attaching said tag to said clothing;

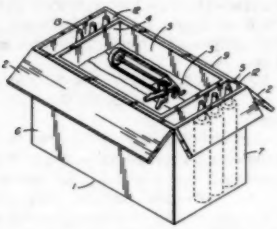
providing a container for storing said tag;

providing an indexing means whereby a plurality of said tags may be indexed within said container according to the indicia of clothing on said tags;

removing the tag from the article of clothing an placing it in a container;

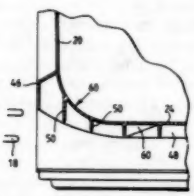
removing the tag from the container, so that it may be used to match articles of clothing with a swatch of material.

5,180,063
FIRE-STOP SEALANT KIT
Michael Sakno, Woodbridge, Canada, assignor to Instant Fire-stop Inc., Toronto, Canada
Filed Nov. 15, 1991, Ser. No. 792,662
Int. Cl.[5] B65D *69/00*
U.S. Cl. 206—582 9 Claims



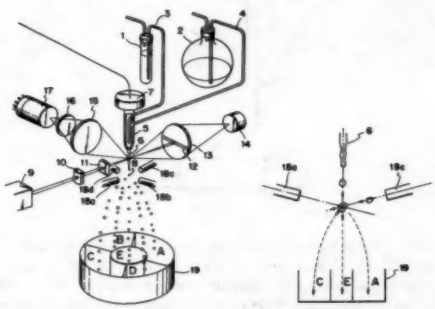
1. A kit of fire stop materials, for sealing penetrations through walls or floors, packaged in a single box, comprising:
(1) a supply of mineral wool;
(2) a supply of intumescent sealant; and
(3) at least one tool for installing the sealant in the form of a caulking gun,
wherein the amount of sealant contained within the kit is proportional to the amount of mineral wool, in accordance with the respective amounts of such materials to be consumed for each penetration to be sealed and wherein the mineral wool is placed centrally within the box, to form a rectangular volume that is bounded by multiple sealant tubes at both ends, said tubes being held between the mineral wool and the box ends to prevent such tubes from being loose within the box.

5,180,064
CONTAINER
Flemming Elvin-Jensen, 4655 Woodgreen Drive, West Vancouver, British Columbia, Canada V7S 2V4
Continuation-in-part of Ser. No. 639,055, Jan. 9, 1991. This application Sep. 23, 1991, Ser. No. 763,742
Claims priority, application Australia, Sep. 24, 1990, PK2442
Int. Cl.[5] B65D *19/00*
U.S. Cl. 206—598 7 Claims



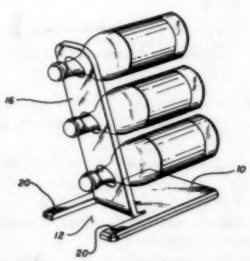
1. A bulk container of the kind used in storage of materials which container is normally transported from location to location by a forklift truck and which comprises containment walls and a base with an opening of predetermined height in its lower portion below the base, said opening being capable of receiving the "tines" of a fork, there being ribs on the underside of the container in said opening and running the direction of the opening characterized in that the base of the container has edge portions which slope up to the containment walls to thereby form an entrance to said opening, said entrance having a vertical height greater than said predetermined height of said opening below the base, and that said ribs extend along the underside of said edge portion.

5,180,065
APPARATUS FOR AND METHOD OF FRACTIONATING PARTICLE IN PARTICLE-SUSPENDED LIQUID IN CONFORMITY WITH THE PROPERTIES THEREOF
Yoshiyuki Touge, and Yoshito Yoneyama, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 11, 1990, Ser. No. 596,083
Claims priority, application Japan, Oct. 11, 1989, 1-264553; Aug. 30, 1990, 2-229679
Int. Cl.[5] B07B *5/36*
U.S. Cl. 209—577 16 Claims



1. An apparatus for fractionating particles in particle-suspended liquid in conformity with properties thereof, comprising:
measuring means for measuring the properties of individual particles in the particle-suspended liquid;
separating means for separating said particle-suspended liquid into separated droplets containing a plurality of the individual particles therein; and
discharging means including a nozzle for selectively discharging a liquid droplet from said nozzle to collide with said separated droplets in accordance with a discharge signal generated on the basis of the result of said measurement by said measuring means.

5,180,066
WINE BOTTLE HOLDER AND DISPLAY RACK
Christopher J. McArdle, P.O. Box 212, Montclair, Calif. 91763
Filed Apr. 20, 1992, Ser. No. 871,130
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—74 2 Claims



1. A one-piece bottle rack for the horizontal storage and display of long-necked bottles comprising: a planar rectangular base member having first and second ends and having a rectangular opening extending inwardly from said first end thereof and terminating at a transverse axis extending across the base member, said opening being bordered by support arms integral with the base member and extending outwardly from the transverse axis on each side of said opening toward said first end, an

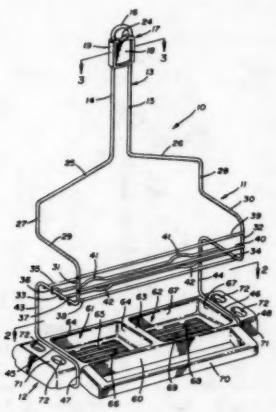
inclined planar ramp member formed integral with said base member at said transverse axis, said ramp member having a plurality of apertures therein for receiving the necks of and supporting one or more wine bottles in generally spaced and parallel relationship with one another and with the base and extending along the base toward the second end thereof, said planar base member including said support arms being of a size sufficient to provide a sturdy and stable platform for the rack when the rack is full, partially full or empty of bottles.

5,180,067

SHOWER CADDY

Brian J. Conaway, Wooster, and Tyrone M. Keyes, Cincinnati, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Jan. 3, 1992, Ser. No. 816,568
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—119 **47 Claims**



1. A shower caddy for holding shower accessories comprising a wire portion for holding the shower accessories and a plastic portion for holding the shower accessories, said wire portion being configured to includes means to engage said plastic portion, said means to engage including generally horizontally oriented upper foot wires, and said plastic portion including a body member having grooves therein to receive said upper foot wires so that said plastic portion may be removably carried by said wire portion.

5,180,068

CONNECTION FOR A STRUCTURAL RACK SYSTEM

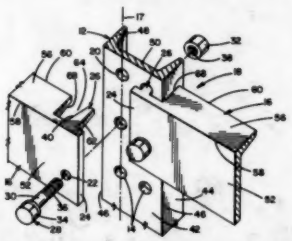
William R. Vargo, Lithonia, Ga., assignor to Hardy Manufacturing, Inc., Lithonia, Ga.

Filed Nov. 25, 1991, Ser. No. 797,181
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—191 **33 Claims**

1. A connection for a rack system joining together first and second elongated structural members, said first member having a plurality of longitudinally spaced aligning holes extending therethrough with each aligning hole having inside bearing surface and said second member having at least one fastening hole extending therethrough adjacent its axial ends, said connection comprising:

said second member having at least one seating lug longitudinally spaced from said fastening hole a distance equal to the longitudinal spacing between said aligning holes in said first member, said seating lug adapted to extend within one of said aligning holes in said first member to position another aligning hole in said first member in registry with said fastening hole in said second member;

fastener means protruding through said fastening hole and said other aligning hole for drawing said first and said second members together; and



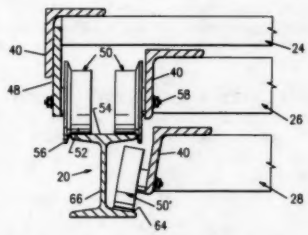
cam means on said seating lug engaging said inside bearing surface of said one aligning hole for moving one of said members into side-by-side contact with the other one of said members when said fastener means draws said first and said second members together.

5,180,069

FOUR-DEEP PUSH-BACK WAREHOUSE STORAGE RACK SYSTEM

John V. R. Krummell, Irvine, and Kenneth E. Davison, Hermosa Beach, both of Calif., assignors to Advance Storage Products, Carson, Calif.

Filed Dec. 6, 1990, Ser. No. 623,124
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—151 **11 Claims**



1. A warehouse storage rack organization including a plurality of vertically spaced bays, each of said bays being adapted to receive up to four loads, said organization comprising:

a single pair of parallel, oppositely spaced rails formed of two structural member, each member having an upwardly facing, generally horizontally extending upper support surface, and vertically spaced therefrom an upwardly facing generally horizontally extending lower support surface;

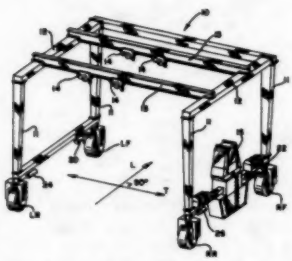
a plurality of carts arranged for nested reception in said bay, said plurality of carts including a first cart having wheels movably supported on said lower support surfaces of said oppositely spaced rails, a second cart arranged, when nested, to overlie said first cart, said second cart having wheels movably supported on said upper support surfaces of said rails such that said wheels of said second cart are disposed to traverse the inner edge of said upper support surfaces, and a third cart arranged, when nested, to overlie said second cart, said third cart having wheels movably supported on said upper support surfaces of said rails such that said wheels of said third cart are disposed to traverse the outer edge of said upper support surfaces.

5,180,070

DIRECTIONAL CONTROL SYSTEM FOR A GANTRY TYPE CRANE

Thomas H. Feider, Sturgeon Bay, Wis., assignor to Shuttelift, Inc., Sturgeon Bay, Wis.

Filed May 30, 1991, Ser. No. 708,901
Int. Cl.[5] B66C 5/02
U.S. Cl. 212—218 6 Claims



1. A directional control system for a gantry type crane, said gantry type crane operable in either a longitudinal direction or a transverse direction, said gantry type crane further having a pair of front wheels and a pair of rear wheels as defined with respect to said longitudinal direction, said control system comprising:

means for pivotally positioning said pair of front wheels and said pair of rear wheels alternatively between either a longitudinal direction or a transverse direction;

longitudinal steering means for cooperatively rotating said pair of front wheels to provide longitudinal steering when said pairs of wheels are directed substantially in said longitudinal direction; and

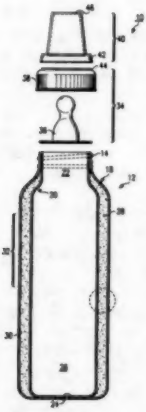
transverse steering means for cooperatively rotating one of said front wheels and an adjacent one of said rear wheels to provide transverse steering when said pairs of wheel are directed substantially in said transverse direction.

5,180,071

INSULATED NURSING BOTTLE/TOY

Penny S. Crosson, 1005 W. Avenue F, Garland, Tex. 75040

Filed Jan. 18, 1991, Ser. No. 645,269
Int. Cl.[5] A61J 9/00, 9/08
U.S. Cl. 215—11.1 5 Claims



1. A combined nursing bottle and toy assembly, comprising:

a nursing bottle having a cylindrical outer shell of a first diameter, and a cylindrical inner container of a second diameter less than the first diameter, the outer shell having a closed bottom and the inner container being supported in the outer shell and separated therefrom to form a space between the inner container and the outer shell;

a flowable medium supported in the space for thermally isolating the inner container from the outer shell, wherein the flowable medium is sand; and

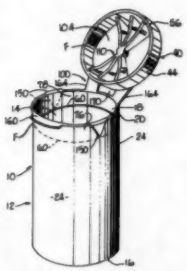
decorative means comprising a plurality of decorative objects of varying colors and geometric shapes that freely float within the flowable medium for creating a pleasing visual effect as the nursing bottle is used.

5,180,072

SAFETY CONTAINER AND CLOSURE SYSTEM WITH CHILD RESISTANCE

Neil L. Oehlert, 2326 N. 81st. St., Omaha, Nebr. 68134

Filed Jul. 23, 1990, Ser. No. 557,169
Int. Cl.[5] B65D 55/02
U.S. Cl. 215—209 20 Claims



1. A child resistant safety device comprising: a container body having a flexible sidewall presenting an opening thereby defining

an interior cavity adapted to receive a substance therein, a flexible closure for covering said opening, hinge means mounting said closure on said body and providing an axis for swinging

movement of said closure between open and closed positions relative to said opening, a flange extending from said closure for reception within said interior cavity of said

container body adjacent to said sidewall, latch means for securing said closure within said opening, and said flange having flexible means responsive to opposing forces applied to said sidewall

along a line of action generally parallel to said axis of swinging movement of the closure for releasing said latch means and urging said closure from said opening toward said open position thereof, thereby to permit access to said interior cavity of said container body.

5,180,073

PERMEABLE CAP FOR FLASK

John E. Fay, and Michael T. Faulkner, both of Leominster, Mass., assignors to Biomedical Polymers, Inc., Leominster, Mass.

Filed May 17, 1991, Ser. No. 703,473
Int. Cl.[5] B65D 53/00
U.S. Cl. 215—261 8 Claims

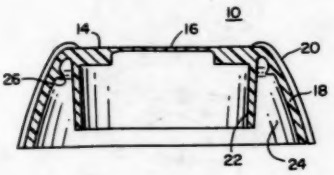
1. A permeable cap for a flask, comprising:

a top portion;

an inner collar extending downwardly from said top portion for insertion into the mouth of a flask, the inner collar being tapered inwardly to positively engage the flask;

an outer collar spaced from said inner collar extending downwardly from said top portion and being flared gener-

ally conically outwardly beyond said top portion to define an enlarged space between said outer collar and the flask below said top portion, said outer collar both covering the lip of the flask and providing a prominent buffer to protect said top portion of the cap and the lip of the flask;



detent means on the inner surface of said outer collar extending inwardly to positively engage the lip of the flask and sealingly engage the cap with the mouth of the flask, said detent means being disposed above said enlarged space between said outer collar and the flask; and

a permeable section in said top portion within said inner collar for enabling exchange of gases in the flask.

5,180,074

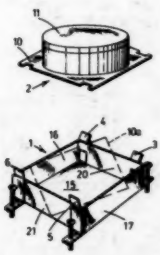
FLOOR BOX

Timothy S. Bowman, and Heidi W. Nufer, both of Parkersburg, W. Va., assignors to Butler Manufacturing Company, Kansas City, Mo.

Continuation of Ser. No. 537,825, Jun. 14, 1990, abandoned. This application Apr. 9, 1991, Ser. No. 683,480

Int. Cl.[5] H02G *3/00*

U.S. Cl. 220—3.8 **7 Claims**



1. An improved floor box for use as part of an infloor electrical power distribution system in a poured concrete floor, which floor box is assembled with other electrical distribution system components, on a sub-floor prior to the pouring of the concrete floor and is, after the concrete pour, closely encased in the poured concrete floor, the floor box comprising:

a box and a cover for fitting on and use with the box; the box including a bottom wall and side walls, with the bottom wall having perimeter edges and with the side walls having first end edges that are connected with the perimeter edges of the bottom wall and second end edges that are spaced from the bottom wall, with the bottom wall and side walls defining a predetermined interior volume with the second end edges of the side walls defining an opening for the interior volume, and with the opening having a particular shape;

means adapted for connecting the ends of electric circuit to at least one of the side walls so that the electrical conduit communicates with the interior volume and the floor box is thus connected with the infloor electrical distribution system;

means adapted for leveling the bottom wall with respect to the sub-floor, the leveling means being affixed to the box and adapted to position the box so that the bottom wall is generally horizontal at a preselected location above the subfloor and the side walls extend upwardly from the bottom away from the subfloor so as to position the opening opposite the subfloor;

said leveling means comprising four leveling screw mounting feet, said feet being integral with the bottom and extending outwardly therefrom and each foot being formed with a strength bending boss and also formed with adjusting screw mounting threads;

the cover having a shape that is congruent to the particular shape of the opening and sized so that it closes the opening when the cover is fitted on the box;

means for holding the cover down and fitted on the box and for assuring that the cover will prevent concrete from entering the interior volume during the concrete pour, the hold down means constructed for snap-in engagement of the cover and the box upon application of a force urging the cover into relation with the box that closes the opening; and

wherein the holddown means includes a plurality of yieldable fingers having an abutment section extending inwardly with respect to the interior volume, to overlie the plane of the sidewalls and having a lead-in section extending outwardly from an inner extent of the abutment section away from the interior volume and beyond the side wall

whereby the cover is secured to the box by pressing the cover against the box to engage the snap-in hold down means so as to seal the box before concrete is poured to form the floor around the in-floor distribution system and the floor box.

5,180,075

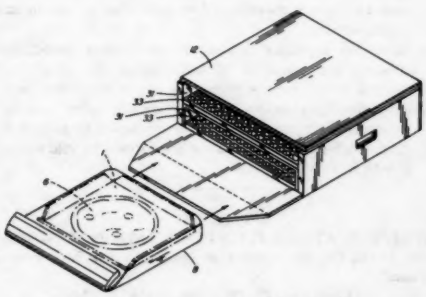
PIZZA PACKAGING SYSTEM

Henry Montalbano, 4206 Hartfield Grove, Mississauga, Canada L4W 2Y8

Filed Oct. 28, 1991, Ser. No. 783,548

Int. Cl.[5] B65D *5/48, 5/60*

U.S. Cl. 220—403 **8 Claims**



1. A pizza packaging system for delivered pizza comprising:

(1) a paperboard tray for carrying pizza;

(2) an enveloping, moisture-permeable bag for covering and containing pizza placed on the aforesaid tray; and

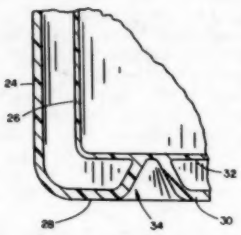
(3) a reusable, insulating outer box, having a compartment formed therein, such compartment being dimensioned to receive a pizza carried by the said tray and contained within the aforesaid bag.

5,180,076

WASTE CONTAINER

Gary Hundt, Lincoln, Nebr., assignor to Progressive Technologies, Inc., Smyrna, Ga.

Filed Mar. 1, 1991, Ser. No. 663,246
Int. Cl.[5] B65D *4/04*
U.S. Cl. 220—420 **9 Claims**



1. A waster container, comprising:

a generally cylindrical double-wall drum having separate spaced apart inner and outer sidewalls and separate spaced apart inner and outer bottom walls;

said inner and outer sidewalls being continously connected at an upper end thereof;

said inner and outer bottom walls being connected in a plurality of spaced apart locations;

a lid removably connected to the upper end of said drum to seal the container;

a neck portion formed at the upper end of said drum, having a greater diameter than the outer sidewall and having inner and outer faces;

the inner face of said neck portion having threads formed therein;

said lid having upper and lower horizontal walls and a generally cylindrical vertical sidewall connecting the upper and lower walls;

said lid having an exterior thread formed in a portion of said sidewall adapted to engage the neck portion thread to connect the lid to the drum;

a vertically-oriented annular trough formed in the connection of said outer and inner sidewalls to said neck portion, and inwardly of said threads on the neck portion;

an annular toe depending from the lower wall of said lid adapted for engagement with said annual trough;

an upwardly projecting annular rib formed immediately adjacent to and inwardly of said annular trough in said drum portion;

an upwardly depressed annular trough formed immediately adjacent and inwardly of said annular toe in said lid, adapted to receive the projecting rib of said drum; and

said annular trough and adjacent rib on said drum forming a generally S-shaped annular surface adapted to engage the generally S-shaped annular surface formed by said toe and trough in said lid.

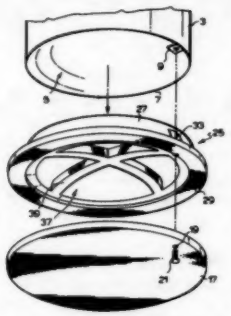
5,180,077

WATER HEATER BOTTOM INSULATION MEMBER

Brian Lewis, Guelph, Canada, assignor to GSW Inc., Fergus, Canada

Filed Apr. 27, 1992, Ser. No. 873,791
Int. Cl.[5] B65D *90/06*
U.S. Cl. 220—444 **11 Claims**

1. A rigid insulation member made from a heat insulating material for fitting internally at the bottom end of a water heater having an inner tank with an upwardly concave base and an outer shell separated by an insulation gap from said inner tank, said insulation member having a one piece construction comprising an upwardly convex center portion for mating with the concave base of the inner tank, a peripheral ring for spanning the insulation gap and an annular channel



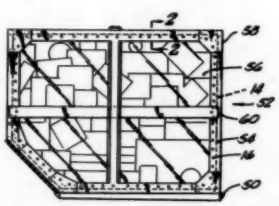
between said center portion and said peripheral ring for seating the inner tank of the water heater.

5,180,078

AIR CARGO CONTAINER

Robert Looker, Carpinteria, Calif., assignor to Satco, Inc., El Segundo, Calif.

Division of Ser. No. 527,042, May 22, 1990, abandoned. This application May 20, 1991, Ser. No. 703,696
Int. Cl.[5] B65D *7/32*
U.S. Cl. 220—665 **9 Claims**



1. In an air cargo container having a base, a frame constructed of metal structural members attached to said base, a skin material which is attached to said structural members and said base to enclose said container, and door means attached to said base and frame for access to the interior of the container, the improvement comprising said skin being polycarbonate sheets attached rigidly to said structural members and said base with said polycarbonate sheets attached to said structural members by attachment means comprising:

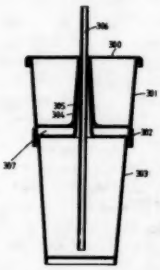
a) said polycarbonate sheet overlapping said structural member along substantially the entire length of the polycarbonate sheet to create an attachment area;

b) an attachment strip having a width not greater than nor substantially less than the width of said attachment area, and having a length not substantially less than the length of said attachment area;

c) said attachment strip having a channel formed therein on the said adjacent said polycarbonate sheet; and

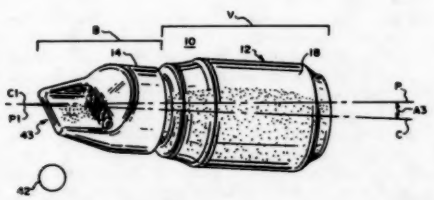
d) rivet or bolt fasteners inserted through aligned and appropriately sized apertures in said structural member, polycarbonate sheet and attachment strip for holding those elements together.

5,180,079
COMBINED CUP
John Jeng, No. 131-1, Chung Cheng Rd., Taitung City, Taiwan
Filed Apr. 6, 1992, Ser. No. 863,004
Int. Cl.[5] B65D *6/00, 21/02, 51.28*
U.S. Cl. 220—705 2 Claims



1. A combined cup comprising a top lid, an upper cup body, a connecting body and a lower cup body which is characterized by that said upper cup body and said lower cup body are connected by said connecting body from between; wherein said connecting body is formed as a disk and is provided with a folded edge around the circumference extending both upward and downward to connect from below with said lower cup body by a folded brim of said lower cup body and connect from above with a bottom of said upper cup body; and an upward sticking conical nozzle is formed in a center of said connecting body for receiving a straw; said nozzle is further provided at a top with a jutted nozzle brim with an outer diameter slightly longer than an outer diameter of a nozzle sleeve formed in a center of said upper cup body.

5,180,080
DISPENSER AND METHOD OF VIEWING GRANULAR DRY MATTER AS IT IS BEING DISPENSED
Robert C. Geschwender, 3855 Orchard St., Lincoln, Nebr. 68503
Filed Dec. 27, 1990, Ser. No. 634,513
Int. Cl.[5] G01F *11/00*
U.S. Cl. 222—1 7 Claims



7. A method of dispensing dry granular material comprising the steps of:

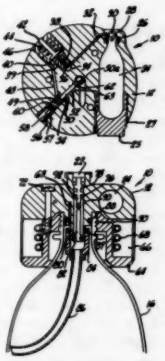
shaking a container with the dry granular material in it wherein the container has a surface with cone-shaped perforations having large open ends opening outwardly from the surface, said perforations being positioned during the shaking so that at least some of the perforations are below at least some of the dry granular material, whereby the dry granular material may pass through the perforations;

catching the cry granular material as the dry granular material passes through the perforations on a surface extending at one angle from the perforations with parallel side wall extending from it to hold the dry granular material between the parallel side wall and which permits viewing of the dry granular material;

permitting one portion of the dry granular material to fall from the dispenser; and

permitting another portion of the dry granular material to fall back from the surface into the large open ends of perforations by changing the orientation of the shaker.

5,180,081
POURING SPOUT AND CARBONATION RETENTION APPARATUS
Gerald P. McCann, Los Angeles, Calif., assignor to McCann's Engineering & Mfg. Co., Los Angeles, Calif.
Continuation-in-part of Ser. No. 473,115, Jan. 31, 1990, abandoned, which is a continuation of Ser. No. 95,362, Sep. 10, 1987, abandoned. This application Feb. 14, 1991, Ser. No. 654,929
Int. Cl.[5] B65D *83/00*
U.S. Cl. 222—23 28 Claims



1. A liquid dispensing apparatus for selectively dispensing a portion of liquid from a container, comprising;

a housing, said housing adapted to be attached to the container;

a vessel for storing and supplying a charge of gas, said vessel contained within said housing;

a spout attached to said housing;

gas channel means for providing fluid communication between said vessel and said container;

piston means for releasing a charge of gas from said vessel through said gas channel means and into said container;

a handle means operably connected tot he piston means and movable with respect to said housing and attached thereto for actuating between an off first position and a dispensing second position;

liquid channel means for transporting the portion of liquid from the container to said spout in response to movement of said handle means; and

means for reducing foam occasioned by passage of the portion of liquid from said spout, wherein said means for reducing foam includes a coiled section of tubing in said liquid channel means through which liquid flows,

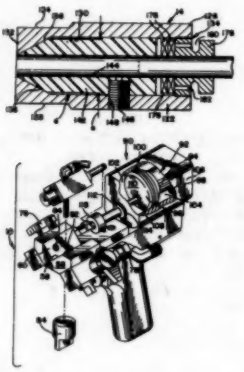
wherein movement of said handle means into the dispensing second position is operative to dispense liquid from said spout.

5,180,082

FOAM DISPENSING GUN WITH IMPROVED DISPENSER MODULE

Raymond Cherfane, Stone Mountain, Ga., assignor to Flexible Products Company, Marietta, Ga.

Filed Oct. 17, 1991, Ser. No. 777,802
Int. Cl.[5] B67D 5/60
U.S. Cl. 222—145 **15 Claims**



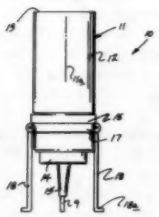
1. A hand held gun for dispensing a reactive chemical foam composition, said gun comprising, in combination, a gun body including means defining a socket for receiving a dispenser module and including means for independently conducting chemical components of said chemical foam composition from sources of said components to said socket under pressure, a dispenser module received in said socket and mounted to said gun body, said dispenser module including a substantially rigid elongate housing having a peripheral sidewall, a front discharge end with a foam discharge opening, an opposed rear end with a rear opening, an elongate passageway having an inner diametrical dimension defined in said housing extending between said front end and said rear opening and a pair of chemical side entry ports extending through said peripheral sidewall at a point intermediate said front discharge end and said rear end in fluid communication with said passageway, an elongate thermoplastic insert member including a front end surface having a foam dispense opening, a rear end surface having a rod-receiving opening, a central core aperture extending therethrough between said foam dispense opening and said rod-receiving opening, and a pair of side openings, said foam dispense opening of said core aperture having substantially the same internal diameter configuration and dimensions as said foam discharge opening, said insert member having an axial length dimension defined between said front end surface and said rear end surface, said insert member further including a stepped outer surface configuration having a step shoulder defined along said outer surface at a point intermediate the length of the insert, a forward minor cross-sectional configuration portion extending rearwardly from said front end surface to said step shoulder having an outer diametrical dimension and a rearward major cross-sectional configuration portion extending rearwardly from said step shoulder to said rear end surface, said side openings being disposed in said rearward major cross-sectional configuration portion, said insert member being telescopically and press-fittingly engaged in said housing passageway so that the front end surface abuts the front discharge end, said foam dispense opening is disposed in registration with said foam discharge opening and said side openings are disposed in sealed, fluid-tight registering relation with said chemical side entry ports, said outer diametrical dimension of said forward minor cross-sectional configuration portion of said insert being less than said inner diametrical dimension of said passageway such that clearance is defined therebetween for relaxation of said insert, said dispenser module further including an elongate valving rod having a forward end portion slidably and sealingly engaged in the core aperture of said insert, said valving rod being movable between a forward closed position wherein the forward end portion extends within said foam dispense opening and along the length of said core aperture, and a retracted open position wherein the forward end portion is spaced rearwardly from said foam dispense opening and said side openings, thereby permitting chemicals to flow through said side entry ports and said side openings into said core aperture and out through the foam dispense opening, said gun further including means for mounting the dispense module to the gun body, and means for moving the valving rod between said open and said closed positions.

5,180,083

GEL DISPENSER APPARATUS FOR EXPRESSING A FLAMMABLE GEL

Michael A. Carlson, 510 Roper Rd., Eugene, Oreg. 97402

Filed Aug. 28, 1991, Ser. No. 751,136
Int. Cl.[5] B67D 5/06
U.S. Cl. 222—185 **2 Claims**



1. A gel dispenser apparatus for expressing a flammable gel comprises,

a cylindrical container, the cylindrical container formed of a flexible shape-retentent material defined along an axis, and

the cylindrical container including a cylindrical side wall, a planar floor mounted to a first end of the cylindrical side wall, and

a top wall, and

a cap member mounted to the top wall, with the cap member including a nozzle to permit expressing of the gel therethrough, and

mounting means for selectively mounting the cylindrical container in a vertical orientation, and

the mounting means includes a cylindrical abutment flange integrally mounted to the cylindrical side wall adjacent the top wall, wherein the abutment flange includes a cylindrical collar mounted to the cylindrical side wall in abutment with the cylindrical flange between the cylindrical flange and the top wall, and the cylindrical collar including a plurality of leg pivots mounted to the cylindrical collar extending radially beyond the cylindrical collar and the abutment flange, and each leg pivot including a support leg pivotally mounted to each pivot, each support leg defined by a predetermined length, the predetermined length substantially equal to a length defined between the leg pivot and the floor, and each support leg including a support leg foot orthogonally and integrally mounted to each distal end of each support leg spaced from each leg pivot, wherein each support leg is arranged in a first position extending beyond the nozzle and pivotal to a second position, wherein each support leg foot is in engagement with the floor, and

the floor includes a support pivot, the support pivot mounted to the floor interiorly of the container coaxially aligned with the axis, and the support pivot including a tether rod, the tether rod mounting an agitator member at a distal end of the tether rod spaced from the support pivot, and

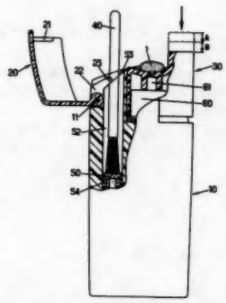
the agitator member includes a mounting plate, the mounting plate including a plurality of radial legs arranged in a single plane, wherein each of the radial legs include an agitator sphere mounted to each radial leg at a distal end of each radial leg spaced from the mounting plate.

5,180,084

APPARATUS FOR DISPENSING COSMETICS

Bernard Favre, Chevilly Larue, France, assignor to Lir France, Chevilly Larue, France

Filed May 15, 1991, Ser. No. 700,701
Claims priority, application France, May 15, 1990, 90 06019
Int. Cl.[5] B67D *5/06*
U.S. Cl. 222—192 **8 Claims**



1. Apparatus for dispensing products such as cosmetics products to be applied by means of a brush, comprising a body containing a sealed reservoir containing a product to be dispensed, a cap pivotable on said body between a closed position and an open position, a pump for pumping the product from said reservoir, a control button for said pump, a plunger reciprocally movable between a lower position and an upper position, a spring biasing said plunger toward said upper position, and an applicator brush supported by said plunger so as to be partially ejected from the apparatus in said upper position of said plunger under action of said spring, said control button being a push-button performing a push stroke to actuate said pump, said push-button and said cap including first means for locking said cap in said closed position by said push-button, for unlocking said cap at a beginning of the push stroke of the push-button and for actuating the pump during a continuation of the push stroke of the push-button, and said cap and said plunger including second means for causing the cap, after unlocking, to pivot toward said open position by said plunger under the action of the spring, and for causing the plunger to move toward the lower position thereof to retract the applicator brush when the cap is pivoted toward said closed position until locking thereof on the push-button.

5,180,085

MANUALLY OPERATED AEROSOL SPRAYER

Hans G. Schmid, 26 Locust La., Huntington, N.Y. 11743

Filed Aug. 9, 1991, Ser. No. 743,924
Int. Cl.[5] B67D *1/04*
U.S. Cl. 222—211 **7 Claims**

1. A mechanically pressurized continuous aerosol sprayer comprising:

a liquid container for holding a liquid;

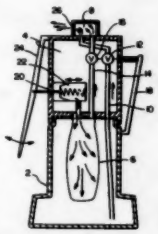
an inflatable bladder located inside the liquid container for forcing the liquid out of the liquid container;

a pump means for filling the inflatable bladder with air;

a spray nozzle;

a spray chamber;

a delivery means for delivering the air from said inflatable bladder to said spray chamber and for delivering the liquid which is forced out of said liquid container to said spray chamber; and



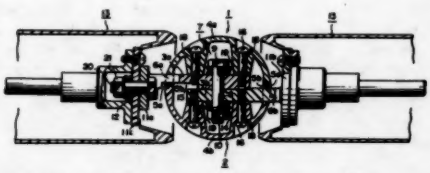
wherein the liquid from the liquid container and the air from the inflatable bladder is mixed in said spray chamber and the mixture of air and liquid is allowed to be sprayed out of the spray nozzle.

5,180,086

JOINT STRUCTURE FOR WINDOW DUMMY

Mitsunori Ikeda, Tokyo, Japan, assignor to Kabushikigaisha Sanmanekin Kougei, Beppu, Japan

Filed Jun. 17, 1991, Ser. No. 716,251
Claims priority, application Japan, Jun. 25, 1990, 2-66986[U]
Int. Cl.[5] D06C *15/00*; F16C *11/00*; F16D *1/12*
U.S. Cl. 223—66 **4 Claims**



1. A joint structure for a window dummy, comprising:

a hollow member having first and second half members each of which is formed with at least one slidably engaging section, said slidably engaging sections being in slidable engagement with each other, and each of said slidably engaging sections having a slit-like cut therein; and

first and second connection members each having first and second ends and being independently fixed to a corresponding one of said first and second half members, said first end of said first and second connection members being rotatably connected to each other, said second end of said first connection member being rotatably connected to a first rod of the window dummy, and said second end of said second connection member being fixed to a second rod of the window dummy;

wherein said first connection member further comprises a tongue-shaped section, a stepped recess section preventing said first connection member from interfering with said slidably engaging section of said second half member, and a disk shaped base section being rotatably connected to said first rod at a right angle relative to a rotating direction of said tongue-shaped section of said first connection member;

wherein said first and second connection members each pass through a corresponding one of said slit-like cuts and into said hollow member;

wherein said second connection member further comprises a tongue-shaped section being rotatably connected to said tongue-shaped section of said first connection member and a disk-shaped base section being fixed to said second rod.

5,180,087

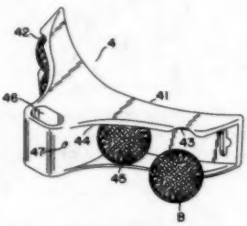
UPPER FIXING MEMBER FOR A GOLF CART

Ching C. Lee, Taipei, Taiwan, assignor to Sun Son Aluminum Factory Co., Ltd., Taipei, Taiwan

Division of Ser. No. 331,062, Mar. 28, 1989, Pat. No. 4,936,598, which is a continuation of Ser. No. 114,726, Oct. 30, 1987, abandoned. This application May 1, 1990, Ser. No. 517,571

Int. Cl.[5] **B60R** *9/00*

U.S. Cl. 224—274 **3 Claims**



1. An upper fixing member for a golf cart, comprising:

(a) attachment means for securing the upper fixing member to the golf cart;

(b) a front edge;

(c) a pair of outwardly projecting wings forming a generic Vee, each wing having an upper plate and a lower plate, with the upper plate and lower plate in each wing forming a chamber therebetween sized to receive at least one golf ball; and

(d) a recess in the upper plate of each wing for inserting the golf balls, and edges along the upper plate and lower plate of each wing for retaining the golf balls once they are inserted.

5,180,088

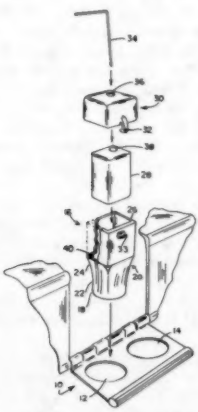
ADAPTER FOR RECEIVING RECTANGULAR BEVERAGE CONTAINERS

Vicki de Angeli, 10802 Coopersmith Ct., N. Potomac, Md. 20878

Filed Dec. 12, 1991, Ser. No. 805,614

Int. Cl.[5] **B60R** *7/00*; **B65D** *25/00*

U.S. Cl. 224—42.42 **10 Claims**



1. An adapter for receiving a rectangular beverage container and stably supporting the same in a beverage holder of a vehicle or the like, comprising:

a cylindrical lower section having upper and lower ends, said lower end being sized to fit within a beverage holder of an automobile or the like;

a central transition section having upper and lower ends, said transition section being connected at its lower end to said upper end of said cylindrical lower section; and

a rectangular upper section having upper and lower ends, and being connected at its lower end to said upper end of said transition section, said rectangular section being open at said upper end thereof to define a rectangular recess to receive a rectangular beverage container of predetermined dimensions.

5,180,089

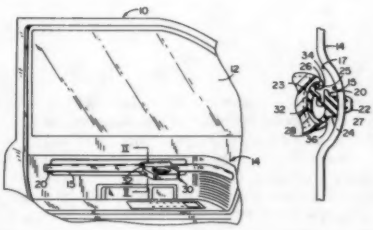
UNIVERSAL VEHICLE ACCESSORY MOUNTING SYSTEM

Michael J. Suman; Stewart D. Reed; Dale J. Frye, all of Holland, and Russell L. Clark, Zeeland, all of Mich., assignors to Prince Corporation, Holland, Mich.

Continuation of Ser. No. 503,514, Apr. 2, 1990, abandoned. This application Dec. 17, 1991, Ser. No. 809,225

Int. Cl.[5] **B60R** *7/00*

U.S. Cl. 224—42.45 R **15 Claims**



1. A system for mounting one or more of a plurality of vehicle accessories to the interior of a vehicle comprising:

a vehicle interior panel mounted in and forming a part of the vehicle;

said vehicle panel having an exposed surface facing the interior of said vehicle;

an elongated first support member having means for releasably receiving an attachment member of an accessory, said first support member including a curvilinear convex surface facing away from said interior panel and a lip formed along the upper edge and along the length of said support member, said lip being hidden from view by said convex surface, means for mounting said first support member to a portion of said exposed surface of said vehicle panel in relationship to said vehicle panel such that said first support member extends substantially along and parallel to said exposed surface of said vehicle panel with said lip spaced from said exposed surface whereby said first support member provides a means for mounting an accessory while providing a decorative trim member for the vehicle; and

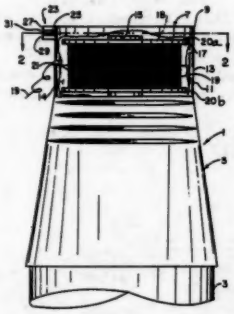
at least one accessory having an attachment member with a length significantly less than the length of said first support member such that said accessory can be mounted over said first support member at a plurality of positions along the length of said first support member, a convex surface of said attachment member adapted to matingly engage said support member, said attachment member including a lip for engaging said lip on said support member when said surface of said attachment member engages with said first support member.

5,180,090

BOTTLE CAP WITH DENTAL FLOSS DISPENSER

Jerry A. Douglas, Harrisburg, Ill., and Walter R. Pfitzinger, St. Charles, Mo., assignors to 7L Corporation, Harrisburg, Ill.

Filed Feb. 25, 1991, Ser. No. 659,900
Int. Cl.[5] B65H *75/32*; A61C *15/04*
U.S. Cl. 225—42 **2 Claims**



1. A bottle cover comprising:

a cap which may be removably received on a bottle to close the bottle, said cap including an upper portion and a lower portion hinged together so that said cap may be opened and closed;

a floss chamber within said cap, said floss chamber receiving a spool of floss received in said chamber;

an exit in said cap through which said floss may be threaded to be pulled from said chamber;

means for cutting said floss to a desired length including a knife blade, an upper shield above said knife blade and a lower shield below said knife blade, said upper and lower shields spaced apart above and below said knife blade so as to expose said knife blade therebetween for cutting said floss, said upper and lower shields further being wider and longer than said blade so as to protect the user against being cut by said knife blade; and

means cooperable with said upper portion for holding said upper and lower portions closed;

said upper portion including means for facilitating opening of said floss container comprising said lower shield of said knife means.

5,180,091

NAILING MACHINE

Hideo Ota, Anjo, Japan, assignor to Makita Corporation, Anjo, Japan

Filed Nov. 29, 1991, Ser. No. 800,102
Claims priority, application Japan, Nov. 30, 1990, 2-341141
Int. Cl.[5] B25C *1/04*
U.S. Cl. 227—8 **3 Claims**

1. A nail machine comprising:

a body;

a driver guide mounted on said body and including a nail guide channel therein;

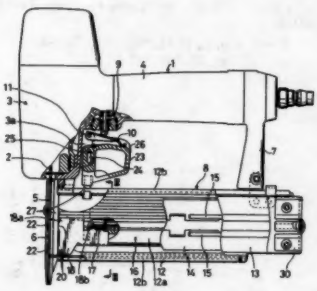
a driver reciprocally movable within the driver guide by a drive device disposed within said body;

a nail magazine mounted on said driver guide and including therein a nail storing channel in communication with said nail guide channel;

a pusher disposed within the nail storing channel for pressing nails stored therein toward said nail guide channel in such a manner that each nail can be in turn driven out of said nail guide channel by the reciprocal movement of said driver, the pusher being movable within said nail storing channel according to the amount of nails stored within said nail storing channel;

a trigger mounted on said body and operable by an operator to move between a starting position for actuating said drive device of said driver and a stopping position for stopping the same;

a stopper directly connected with said trigger at one end and having an engagement portion at the other end, said stopper movable between a first position corresponding to the starting position of said trigger and a second position corresponding to said stopping position in such a manner that said stopper is moved from said second position to said first position in response to the actuation of said trigger from said stopping position to said starting position; and



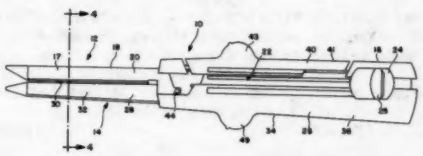
said pusher including an engaging member disposed within the nail magazine and movable with the pusher, said engaging member being engageable with the stopper engagement portion when positioned at the second position so as to prevent movement of the trigger from said stopping position to said starting position when the amount of the nails stored within said nail storing channel is less than a predetermined amount.

5,180,092

LINEAR SURGICAL STAPLING INSTRUMENT

Lawrence Crainich, P.O. Box 996, Charlestown, N.H. 03603

Filed Feb. 5, 1992, Ser. No. 831,516
Int. Cl.[5] A61B *17/072*
U.S. Cl. 227—180 **15 Claims**



1. A linear surgical stapling instrument, comprising:

(a) a magazine for holding a plurality of undeformed surgical staples;

(b) an elongated upper jaw carrying said magazine, said upper jaw comprising an elongated top beam having a U-shaped cross-section;

(c) an elongated lower jaw generally parallel to the upper jaw formed as a channel having an elongated bottom beam with a generally U-shaped cross-section defined by a back portion having an outer surface and two opposing leg portions, the outer surface of said back portion defining an anvil having at least one staple deforming pocket formed therein, said upper and lower jaws being configured to mate with each other and grip therebetween tissue to be sutured, with the top and bottom beams fitting together in parallel relationship with said anvil and said magazine in confronting relation;

(d) means mounted in said upper jaw for driving staples held in said magazine toward said anvil; and

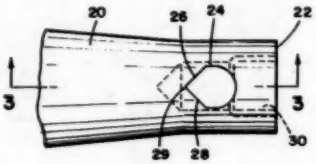
(e) a bottom housing having a generally U-shaped cross-section which partially encloses the bottom beam and which forms a hand grip, wherein the bottom beam includes a nose portion which fits into a complementary receiving portion in the bottom housing.

5,180,093

APPARATUS FOR ULTRASONIC BONDING

Randall R. Stansbury, Jim Falls, and Michael R. Seitz, Chippewa Falls, both of Wis., assignors to Cray Research, Inc., Eagan, Mich.

Filed Sep. 5, 1991, Ser. No. 755,067
Int. Cl.[5] B23K *20/10*
U.S. Cl. 228—1.1 5 Claims



1. An ultrasonic transducer device adapted to hold an ultrasonic bonding tool having a substantially circular cross-section, the device comprising:

a first end adapted to cooperate with the bonding tool;

a bonding tool passage formed in the transducer proximate said first end,s aid bonding tool passage adapted to receive the bonding tool in an orthogonal relationship relative to a longitudinal axis of siad device, said bonding tool passage having at least two substnatially flat surfaces which intersect each other opposite said first end; and

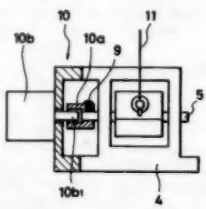
at least one retaining passage formed in said first end, each retaining passage intersecting aid bondign tool passage and extending through said flat surfaces forming a four-point contact area in said flat surfaces, each retaining passage further adapted to receive retaining means for retaining the bonding tool within said bonding tool passage.

5,180,094

WIRE BONDER WITH BONDING ARM ANGLE SENSOR

Katsuro Yanagida, and Yoshikatsu Hayashizaki, both of Tokyo, Japan, assignors to Kaijo Corporation, Tokyo, Japan

Filed Feb. 25, 1992, Ser. No. 841,332
Claims priority, application Japan, Feb. 27, 1991, 3-053516
Int. Cl.[5] B23K *20/10*; H05K *13/06*
U.S. Cl. 228—4.5 10 Claims



1. A wire bonder, comprising:

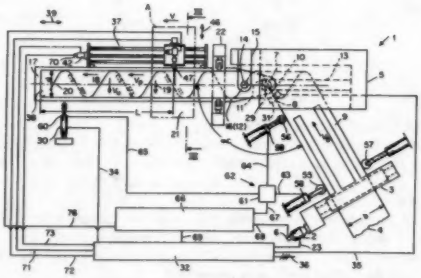
a head base provided on a member capable of planar movement in at least the X and Y directions; a shaft supported by said head base; a bonding arm provided so as to be allowed to freely oscillate about said shaft while supporting a bonding tool through which a wire is passed; and an angle sensor provided on said wire bonder which detects, without making contact with any moving element, the angle of rotation of said bonding arm as it pivots about said shaft.

5,180,095

MACHINERY FOR WELDING HELICAL-SEAM PIPE FROM METAL STRIP

Heinz-Dietmar Orth, Dortmund, Fed. Rep. of Germany, assignor to Hoesch Maschinenfabrik Deutschland AG, Dortmund, Fed. Rep. of Germany

Filed May 22, 1992, Ser. No. 888,032
Claims priority, application Fed. Rep. of Germany, May 29, 1991, 4117555
Int. Cl.[5] B23K *28/02*; B21C *37/12*
U.S. Cl. 228—17.7 4 Claims



1. An arrangement for welding helical-seam pipe from metal strip, comprising: strip feed means; strip shaping means receiving metal strip from said feed means and shaping said strip into pipe with a seam and a longitudinal axis and circumference; means for rotating said pipe; pipe sectioning means with a cutter movable back and forth along said longitudinal axis for cutting sections from said pipe with different lengths as said pipe is rotated about said longitudinal axis and exits from said arrangement; means for welding said seam; means for controlling a welding gap between a section of said strip and beginning of said pipe; first detector means for controlling speed of said cutter moving along said pipe by detecting speed of travel of said strip; second detector means for controlling a strip-infeed angle between a section of the strip and said longitudinal axis of said pipe; and third detector means for controlling axial deviation of cutting over a predetermined angle to said cutter at the circumference of the pipe.

5,180,096

METHOD AND APPARATUS FOR REFLOW-SOLDERING OF PRINTED CIRCUIT BOARDS

Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netsu Keiki Co., Ltd., Tokyo, Japan

Filed Jul. 24, 1991, Ser. No. 735,352
Claims priority, application Japan, Jul. 25, 1990, 2-194772; Feb. 26, 1991, 3-53132; Feb. 26, 1991, 3-53133
Int. Cl.[5] B23K *1/19, 31/02*
U.S. Cl. 228—180.1 5 Claims

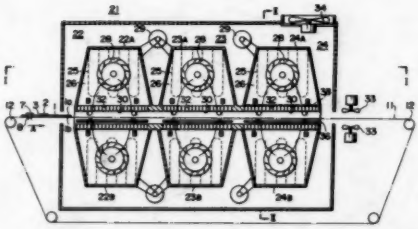
1. A method for reflow-soldering of printed circuit boards, each of said circuit boards having an obverse surface on which is mounted by soldering one or more electronic parts of a first group having relatively high temperature resistance and a reverse surface having penetrated apertures which extend through said board and open on said obverse surface through which lead wires of one or more electronic parts of a second group having relatively low temperature resistance are to be inserted, said method comprising:

positioning each of said boards to place said reverse surface

upwardly and applying solder paste to the penetrated apertures;

turning each of said boards to position said obverse surface upwardly and inserting the lead wires of the electronic parts of the second group into the penetrated apertures open on the obverse surface and extending the lead wires through the solder paste on the reverse surface; and

transferring the printed circuit boards to and through a heating zone having plural preheating chambers and a reflowing chamber longitudinally arranged in series in such manner that the individual boards are aligned closely without intervening spaces on a conveyer passing through



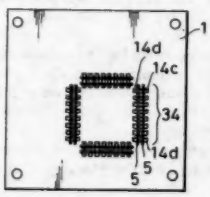
the heating zone, and wherein the upper portions of the preheating chambers and the reflowing chamber facing the obverse surfaces of the boards are controllably heated to a temperature lower than the heat-resistance temperature of the electronic parts of the second group, while the lower portions of the preheating chambers and the reflowing chamber facing the reverse surfaces of the boards are controllably heated such that the temperature in the lower portion of the reflowing chamber is higher that the melting point of the solder paste, whereby the solder paste on the reverse surface of each board is molten to solder the second group of electronic parts to the board.

5,180,097

METHOD OF MOUNTING AN ELECTRONIC PART ONTO A PRINTED CIRCUIT BOARD

Yoshio Zenshi, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Hyogo, Japan

Filed Sep. 20, 1990, Ser. No. 585,700
Claims priority, application Japan, Oct. 3, 1989, 1-259284
Int. Cl.[5] H05K *3/34*
U.S. Cl. 228—180.2 **15 Claims**



1. A method of mounting an electronic component, by reflow soldering, onto a printed circuit board, the electronic component having a plurality of connection leads protruding therefrom, the method comprising the steps of:

applying a plurality of strips of solder on a group of pads arranged in a line on the printed circuit board, the group of pads being disposed in a one to one correspondence with the connection leads, each of the plurality of strips of solder traversing the group of pads; and

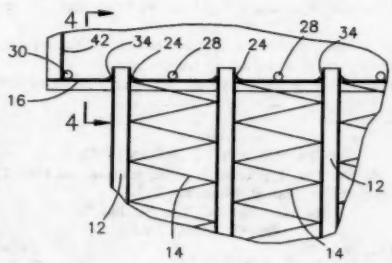
bonding the connection leads of the electronic component to corresponding pads of the group of pads, by reflow soldering, to the plurality of strips of solder.

5,180,098

AIR CONDITIONER CONDENSER ASSEMBLY

Gary A. Halstead; Brian L. Barten, and Terence Trentacoste, all of Lockport, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 23, 1992, Ser. No. 856,275
Int. Cl.[5] B23K *1/19, 35/363*
U.S. Cl. 228—183 **7 Claims**



1. A method for assembly of a condenser suitable for use in an automotive air conditioner or other refrigeration unit, comprising:

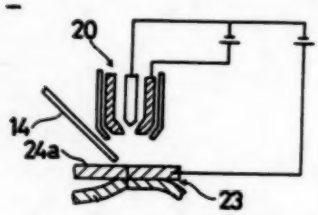
providing a pair of spaced headers formed from an aluminum alloy brazing stock material wherein said aluminum alloy brazing stock material comprises an aluminum alloy core layer clad on at least a first surface with an aluminum-silicon brazing alloy, each of said spaced headers having a corresponding plurality of perforations;

depositing a braze flux on at least said first surface of each of said headers, said braze flux being deposited between each of said plurality of perforations in an amount sufficient to deoxidize and wet a region adjacent said perforations during a subsequent brazing operation, said braze flux comprising about 40 to about 60 weight percent potassium fluoaluminate particles dispersed in a liquid carrier, said liquid carrier consisting essentially of, by weight, from about 90 percent to 100 percent of a water miscible polyhydric alcohol of two to four carbon atoms and up to about 10 percent water;

inserting a tube into each of said corresponding perforations within each of said headers so as to extend in hydraulic parallel between said headers, such that each of said first surfaces of said headers having said braze flux are oppositely disposed across said extended plurality of tubes; and

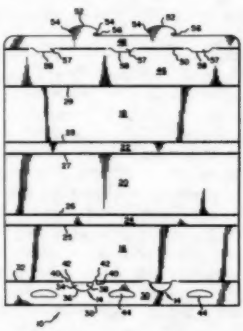
brazing said plurality of tubes within said perforations of said headers by sufficiently heating said aluminum-silicon brazing alloy and said braze flux such that said braze flux deoxidizes said aluminum alloy core layer and said aluminum-silicon brazing alloy at said perforations while also enhancing the flowability of said aluminum-silicon brazing alloy, thereby being effective to form leak-proof brazed joints at said perforations so as to produce a leak-proof condenser suitable for use in a refrigeration system.

5,180,099
PROCESS OF JOINING OF A GALVANIZED STEEL SHEET
Makoto Okabayashi, Anjo; Masami Ishii, Toyota; Juniti Mita, Anjo, and Shigeo Shinagawa, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Jul. 18, 1991, Ser. No. 731,878
Claims priority, application Japan, Jul. 19, 1990, 2-190999
Int. Cl.[5] B23K *1/19, 1/20*
U.S. Cl. 228—263.14 2 Claims



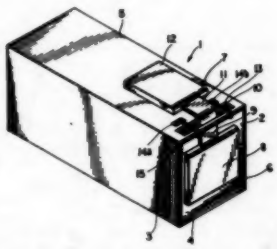
1. A method of joining two galvanized steel sheets, comprising:
using a solder including copper and approximately ten to thirty percent of nickel by weight; and
joining the solder to the two sheets with a welding machine.

5,180,100
WRAPAROUND CARTON LOCK
Jamie A. Shimizu, Hackensack, N.J., assignor to Oak Tree Packaging Corporation, Montvale, N.J.
Filed May 20, 1992, Ser. No. 885,762
Int. Cl.[5] B65D *5/42*
U.S. Cl. 229—198.2 2 Claims



1. A locking arrangement for a carton having overlapping closure panels including an inner closure panel and an outer closure panel, a male locking member carried by and attached to said outer closure panel, said inner closure panel being connected to a second along a generally transversely extending fold line, a female locking member located along said fold line and including a cutout portion for receiving said male locking member, said cutout portion being located substantially within the confines of said inner closure panel primarily on one side of said fold line and having a generally arcuate boundary having ends thereof joined by a rectilinear chord extending therebetween, locking ear means located along said fold line adjacent said chord and said cutout portion for being engaged by said male locking member for retaining said male locking member within said cutout portion, said locking ear means comprising a pair of tab members carried by said inner panel adjacent to said cutout portion, and said tab member being cut from said second panel along curved cut lines and extending from said inner closure panel across said fold line.

5,180,101
NEWSPAPER ALERT APPARATUS
Christopher H. Thompson, 240 Georgetown Rd., Weston, Conn. 06833
Filed Feb. 18, 1992, Ser. No. 837,808
Int. Cl.[5] B65D *91/00*
U.S. Cl. 232—34 8 Claims



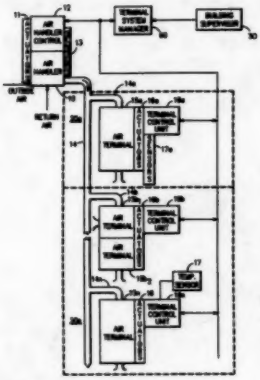
1. A newspaper box having delivery indicating means comprising a container having a top wall, a bottom wall and a pair of side walls, and having an open forward end, the top wall having a forward edge which defines an edge of the open end, a slot provided in the top wall and extending substantially parallel to the forward edge, a pair of holes provided in the top wall, and disposed adjacent to the slot, the holes axially aligned with each other and substantially parallel to the slot, the slot disposed between the holes and the forward edge, hinge means disposed in the slot in the tip wall, a pair of wire loops extending through the holes and through open end, the hinge means contained within the loops and rotatably supported thereby, a flap integral with the hinge means and extending downwardly therefrom into the container open end and a flag extending at a right angle to the flap integral with the hinge means, the flag resting on top of the top wall when the box is empty, and in an upright position when a newspaper is placed in the box.

5,180,102
TEMPERATURE CONTROL SYSTEM FOR ZONED SPACE
Jeffrey S. Gilbert, Cicero, and Brett A. Desmarais, Clay, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Aug. 12, 1991, Ser. No. 744,048
Int. Cl.[5] F24F *7/00*
U.S. Cl. 236—49.3 3 Claims

1. A temperature control system for controlling the flow of air into a plurality of temperature zones of a building, each temperature zone having at least one air terminal to adjustably maintain a variable volume of air into the associated temperature zone, comprising:
a system management means generating a desired air flow setpoint schedule for the plurality of temperature zones, and
a terminal control means for each temperature zone for receiving the generating desired air flow setpoint for varying the air through an associated air terminal to the desired air flow setpoint;
wherein said desired air flow setpoint is calculated using the following formula:

$$\text{Flow Setpoint} = G_f \times (K_p \times P + K_i \times I + K_d \times D)$$

where:
P=Temperature Setpoint−Zone Space Temperature, (for heating), or Zone Space Temeprature−Temperature Setpoint, (for cooling);



$I = \Sigma I + (P \times R_1)$
$n = 0$ to ∞

where R is the periodic running rate of this process; and I is sum of all I terms from I_0 to In_n

K_I=0.06, in 1/° F. seconds;

If $I > 100$ ($K_I \times G_I$), then $I = 100/(K_I \times G_I)$, and

If $I < 0$, then I=O;

D=(P−Previous P)/R, where R is the periodic running rate of this process;

K_d=1, in seconds/°F.; and

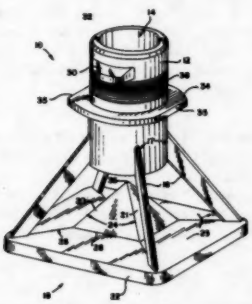
G_I=Temperature loop Gain Multiplier, having a range from 0.1–10.

5,180,103

SPRAY NOZZLE FLUID DISTRIBUTION SYSTEM

Richard H. Harrison, Jr., Columbia, and Bryan F. Garrish, Ellicott City, both of Md., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Jul. 31, 1991, Ser. No. 738,681
Int. Cl.[5] B05B *1/26*
U.S. Cl. 239—1 **37 Claims**



19. A method of distributing a fluid stream comprising the steps of:

forming a relatively flat, uniform, stable first plane of fluid, intersecting said first fluid plane with a separate second fluid plane, thereby causing a generally uniform dispersion of fluid underneath said intersecting first and second fluid planes; and

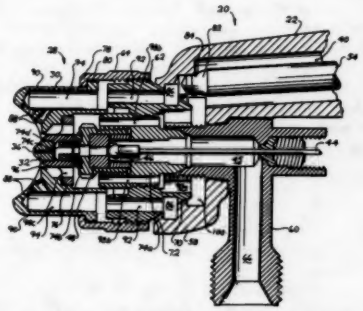
further intersecting said first fluid plane with a plurality of separate fluid planes such that said first fluid plane undergoes a plurality of intersections prior to said first fluid plane reaching the surface to which said fluid stream is being distributed.

5,180,104

HYDRAULICALLY ASSISTED HIGH VOLUME LOW PRESSURE AIR SPRAY GUN

Robert R. Mellette, Nederland, Colo., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Filed Feb. 20, 1991, Ser. No. 658,080
Int. Cl.[5] B05B *1/26, 1/28*
U.S. Cl. 239—8 **17 Claims**



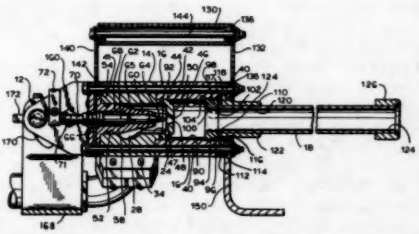
1. A method of performing high volume low pressure air spraying of liquid coating material, comprising the steps of delivering liquid coating material to a spray head; emitting the coating material delivered to the spray head from an elongate fluid orifice in the spray head in a flat fan-shaped pattern; supplying air to the spray head at a flow rate in excess of 10 CFM at the spray head and at a pressure of less than 15 psi at the spray head; and emitting the air supplied to the spray head from an atomizing air orifice in the spray head, that encircles the elongate fluid orifice, to break up the flat fan-shaped pattern of coating material into a flat fan-shaped atomized spray.

5,180,105

SNOW MAKING APPARATUS

W. Dorwin Teague, 155 Tweed Blvd., Nyack, N.Y. 10960, assignor to Dorwin Teague, Nyack, N.Y.

Filed Feb. 26, 1991, Ser. No. 661,550
Int. Cl.[5] F25C *3/04*
U.S. Cl. 239—14.2 **23 Claims**



1. Apparatus for producing snow comprising, a plurality of components aligned along a longitudinal axis, said components including a first hollow body having a water inlet port and a rounded edge water outlet orifice, said water outlet orifice being located in said body concentric to said axis, said outlet orifice having an approach which curves from a first large diameter in said body to a smaller diameter throat at the face of the orifice, a needle guide housing contained at least partly in said first body concentric therewith, a needle valve movably

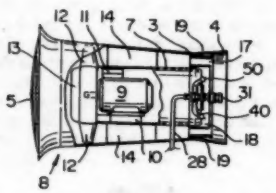
mounted in said needle guide housing and having a tapered end extending from said housing towards said orifice; means for selectively adjusting the needle in said needle guide housing for adjusting the position of s id tapered end with respect to said orifice, thereby to control the flow of water from said body through said orifice; a second hollow body having front and rear ends and arranged concentrically with said first body, said second body receiving within its rear end said orifice of the first body and having an air inlet port formed therein and a rounded edge outlet orifice in the front end of said second body for discharging a mixture of air and water from said second body, said outlet orifice in the second body having an approach which curves from a first diameter to a smaller diameter throat downstream of the first diameter; a mixing tube bracket having a piloted inner end portion received in the front end of said second body concentrically therewith, a mixing tube having an internal diameter equal to the second diameter of the throat in said second body and being mounted in said bracket concentrically therewith; and means for clamping said needle guide, first and second bodies, and said mixing tube bracket together in a composite structure.

5,180,106

SNOW MAKING MACHINE

Louis Handfield, Quebec, Canada, assignor to Turbines S.M.S. Inc., Canada

Filed Apr. 22, 1991, Ser. No. 688,440
Claims priority, application Canada, Apr. 24, 1990, 2015259
Int. Cl.[5] F25C *3/04*
U.S. Cl. 239—14.2 **56 Claims**



1. A device for producing an airborne stream of ice crystals, said device comprising:

an elongated outer housing;

an elongated inner housing mounted within said outer housing, said housings defining therebetween an air passage having a venturi-shaped zone to cause a gradual increase of velocity of air flowing through said passage;

a flaring nozzle mounted to an outlet end of said outer housing;

a vaneaxial fan in said outer housing;

a plurality of guide vanes extending between said housing, said vaneaxial fan and said guide vanes constituting means for producing a high velocity, substantially rectilinear air flow through said passage;

a diffuser adjacent to an outlet end of said inner housing for creating a substantially annular and substantially rectilinear stream of air at the outlet end of said inner housing, said diffuser and said flaring nozzle creating an outer, annular, diverging stream of air generally coaxial with said substantially rectilinear stream of air;

a water nozzle of spraying a diverging stream of water into said streams of air; and

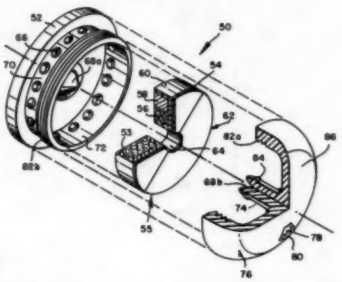
a plurality of nucleators in the outlet end of said inner housing for spraying fine water droplets downstream of the outlet end of said inner housing, said fine water droplets forming nuclei to induce ice crystals formation whereby, temperature permitting, water drops of said stream of water adhere to said nuclei to form ice crystals.

5,180,107

DISPENSING UNIT OF VOLATILIZABLE SUBSTANCE CAPABLE OF VISIBLE DETERMINATION OF ITS EXTENT OF USE

Jerome I. Lindauer, Hillsdale, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Nov. 8, 1991, Ser. No. 789,680
Int. Cl.[5] A61L *9/00*
U.S. Cl. 239—35 **1 Claim**



1. A dispensing unit of a volatilizable substance capable of visible determination of its extent of use comprising:

(1) a vertically positioned rotatable laminar support capable of rotation in a vertical "x-y" plane about a "z" axis, said "z" axis being perpendicular to said "x-y" plane, said support having located thereon and affixed thereto in the proximity of said "x-y" plane:

(A) a gravity-activated weight permanently affixed to said support; and

(B) a volatilizable substance,

said gravity-activated weight being eccentrically located in the proximity of said "x-y" plane with respect to the centroid of the dispensing unit, said support having a variably-located centroid initially positioned proximate the geometric center point of the unit with the centroid moving in a downward direction in said "x-y" plane when the unit is in use; and

(2) a sighting mechanism means for viewing at least a portion of said laminar support in a direction parallel to said "z" axis and perpendicular to said "x-y" plane, whereby as the volatilizable substance evaporates, the gravity-activated weight angularly rotates about said "z" axis leaving an initial position and finally coming to rest at a resting position when the volatilizable substance is used up and whereby at least the final position of the weight is visibly detectable through said sighting mechanism means.

5,180,108

TRUCK WITH A POWER SPRAY DEVICE

Yasuhiko Miyamoto, Ohmiya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 428,341, Oct. 27, 1989, abandoned. This application Dec. 14, 1990, Ser. No. 628,934
Claims priority, application Japan, Oct. 31, 1988, 63-142183[U]
Int. Cl.[5] B60P *3/30*
U.S. Cl. 239—172 **3 Claims**

1. A truck having a first engine for driving wheels of the truck, a fuel tank for providing fuel for the first engine and a loading platform, comprising:

a frame secured to an underside of the loading platform;

a power spray device securely mounted on the frame for fluid comprising fluid-like chemicals and water;

the power spray device comprises:

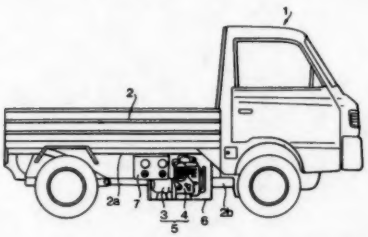
pumping means for pumping said fluid and for providing a pumped fluid; and

a second engine operatively connected to and driving said pumping means;

a fluid tank adapted to contain said fluid and removably mounted on said loading platform;

means connected to said fluid tank and said pumping means for supplying said fluid to said pumping means;

hose reel means removably mounted on said loading plat-



form and connectable to said pumping means for spraying said pumped fluid; and

fuel supply means connected to the fuel tank and the second engine for supplying fuel from the fuel tank to the second engine so as to improve workability of spraying operation and driving stability of the truck.

5,180,109

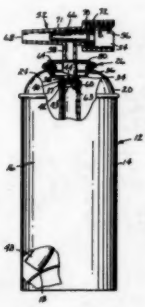
SINGLE USE SPRAY DISPENSING ASSEMBLY

Neil J. Schwartzbauer, Hastings, and Douglas J. Laska, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 5, 1991, Ser. No. 710,688

Int. Cl.[5] B05B *7/30*

U.S. Cl. 239—346 **19 Claims**



1. A spray dispensing assembly for liquid materials comprising:

a container having a chamber with an opening;

a captive cap non-releasably connected to said container and extending across said opening, said captive cap including a hole;

a spray head having a first inlet with a connection for detachable joining with a source of pressurized air, a second inlet for liquid material and an outlet for discharging a spray of liquid material;

a coupling for coupling said second inlet of said spray head to said hole of said captive cap, said coupling including a threaded portion complemental to said threads of said captive cap for securing said spray head to said container; and

a tube in said chamber, said tube having a first end portion located in said chamber at a position remote from said captive cap, said tube having a second end portion fixed to said captive cap next to said hole for communication with said second inlet of said spray head.

5,180,110

BLOW TUBE REMOVAL

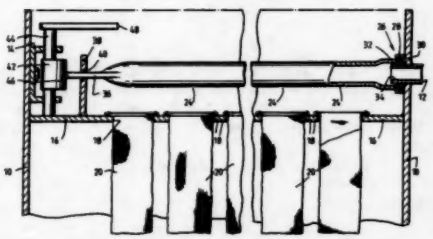
Warren L. Brame, Castle Hill, Australia, assignor to Hosokawa Micron Australia Pty. Ltd., Wetherill Park, Australia

Filed Aug. 13, 1991, Ser. No. 744,299

Claims priority, application Australia, Aug. 14, 1990, PK1708

Int. Cl.[5] B05B *1/20*

U.S. Cl. 239—566 **5 Claims**



1. A dust collector blow tube comprising a blow tube being open at a first end and closed at a second end, said first end being adapted to be reasonably and sealingly received over a supply pipe; said second end being adapted to be acted up by pressure means so as to place pressure on said second end of said blow tube to force said first end over said supply pipe; characterised in that said pressure means comprises a cylinder mounted about a substantially vertical shaft substantially parallel to but spaced from the longitudinal axis of said cylinder so as to provide a cam effect, rotation of said cylinder about said vertical shaft providing said pressure.

5,180,111

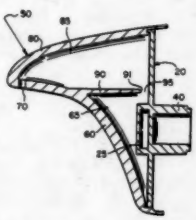
CONTROLLED FLOW DISPENSING UNIT

Thomas G. Hart, North Brunswick, N.J., assignor to American Standard Inc., New York, N.Y.

Continuation of Ser. No. 598,905, Oct. 16, 1990, abandoned. This application Jun. 19, 1992, Ser. No. 900,763

Int. Cl.[5] B05B *1/22*

U.S. Cl. 239—590 **8 Claims**



1. A water spout for creating a sheet-like water flow comprising:

a rear wall, a spout cover coupled to said rear wall, said spout cover having a top wall and a forward wall;

a substantially planar baffle extending substantially horizontally from said forward wall to a position proximate said rear wall and terminating in a rear edge thereby forming a gap between said rear wall and said rear edge, said rear edge of said baffle being substantially flat in cross-section;

a first fluid chamber defined at least in part by said rear wall and a bottom side of said baffle;

a second fluid chamber defined at least in part by said rear wall and a top side of said baffle, said second chamber having a volume larger than the volume of said first chamber, said second chamber including a surface on said for-

ward wall which slopes upwardly in the direction of water flow from said gap;

an inlet having an opening in said first chamber and a central longitudinal axis extending towards said forward wall;

an inlet cover positioned proximate said inlet for diverting inflowing water away from said longitudinal axis in a lateral direction into said first chamber; and

a downwardly facing elongated outlet in said forward wall open to said second chamber for directing water out of said second chamber, said outlet disposed at a position higher than said rear edge of said baffle.

5,180,112

DRIVE ARM FOR A SPREADER

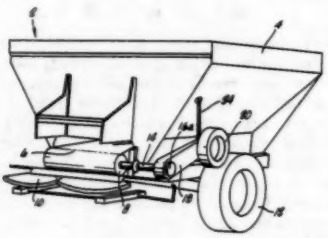
David S. Hoyle, Main Road, Maungaturoto, New Zealand

Filed Nov. 6, 1990, Ser. No. 610,203

Claims priority, application New Zealand, Nov. 6, 1989, 231278

Int. Cl.[5] A01C *17/00*; B60K *25/08*

U.S. Cl. 239—685 **8 Claims**



1. A substantially elongate drive arm for a vehicular spreader, said drive arm mounted to extend substantially radially from a spreader drive shaft, a drive wheel provided on said drive arm being spaced from said drive shaft, said drive wheel and said drive shaft being connected by a drive means mounted on said drive arm to enable the transfer of driving forces therebetween, said drive arm pivotable in a first direction relative to said drive shaft to engage said drive wheel with a ground wheel of said spreader to enable the transmission of a driving force from said ground wheel to said drive shaft, said drive shaft being driven rotatably in a second direction opposite to said first direction such that in use a torque reaction occurs in response to the action of the driving force on a load in said drive shaft whereby forces of engagement urging contact between the drive wheel and the ground wheel increase as the load increases.

5,180,113

PULVERIZING TECHNIQUE AND ROLLING MILL FOR USE THEREIN

Bodo Gehrke, Hemmingen, Fed. Rep. of Germany, assignor to EVT Energie- und Verfahrenstechnik GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 31, 1991, Ser. No. 648,225

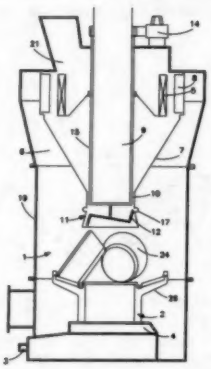
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1990, 4002867

Int. Cl.[5] B02C *15/00*

U.S. Cl. 241—79.1 **8 Claims**

1. In a grinding mill having a rotatable bowl with associated grinding rollers, the mill having drive means for imparting rotation to the bowl and further having means for delivering raw material to be ground to the bowl, ground material which overflows the bowl being entrained in a carrier gas, the mill also including means for separating partially ground material of particle size above a preselected minimum from the carrier gas stream for return to the bowl for further grinding, the improvement comprising:

stirring means located upstream of the mill bowl in the direction of material flow, said stirring means establishing a stirring zone to which the raw material and separated partially ground material is delivered, said stirring means



homogeneously mixing the raw material and partially ground material and releasing said mixture to the mill bowl.

5,180,114

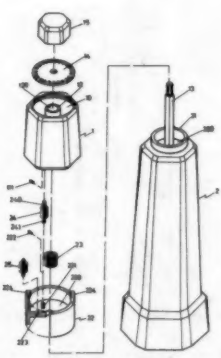
PEPPER GRINDER

Tzung-Wen Chen, No. 13, Yen-Ping St., Tainan, Taiwan

Filed Mar. 16, 1992, Ser. No. 852,405

Int. Cl.[5] A47J *42/04*

U.S. Cl. 241—169.1 **8 Claims**



1. A pepper grinder comprising:

a rotatable cap having a salt sprinkling lid covering an upper opening of a salt chamber;

a body having a pepper chamber, a circular lower wall around the opening;

a turning rod extending through the interior of said rotating cap and said body;

a gear unit having a rod gear fixed to the turning rod,

said rotatable cap having two mortises and a vertical hollow middle post in the salt chamber for the turning rod to extend upwardly through the opening, a screw button screwed to the top end of the turning rod, a horizontal intermediate wall to separate that salt chamber from the gear unit;

a position cylinder having a bottom wall, two opposite tenons on its top to engage said mortises in said rotating

cap, said position cylinder fits around the circular lower wall of said body;

a base having inner, intermediate, and outer layer;

a grinding unit having a grinding wheel fixed to the lower end of the turning rod and a grinding cylinder secured to the outer layer of said base which surrounds the grinding wheel;

a first gear having a square upper shaft to fit within a moving gear recess via a first compression spring in the intermediate wall and to fit within a moving gear groove via a second compression spring in the bottom wall of said position cylinder;

said moving gear recess being parallel to the turning rod;

said first gear moves but does not rotate within said moving gear recess and said moving gear groove;

said first gear engaged with the rod gear and a second gear;

said rotatable cap moves said second gear when rotated in a clockwise manner, said second gear then engages and rotates the first gear which rotates the rod gear and turning rod, therefore, said turning rod rotates in a clockwise manner to grind pepper;

said rotatable cap does not move said second gear when rotated in a counterclockwise manner, whereby said second gear does not engage said first gear to rotate said rod gear and said turning rod.

5,180,115

TORQUE-TRANSMISSION DEVICE

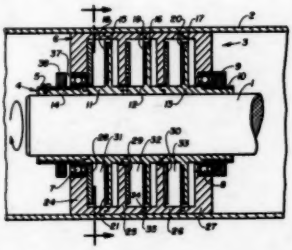
Hans Stein, Hainburg, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 26, 1990, Ser. No. 515,700

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1989, 3913919

Int. Cl.[5] B65H *18/04*

U.S. Cl. 242—56.9 **8 Claims**



1. In a winding device adapted to simultaneously wind several widths of material onto reel cores, the winding device having a driven reel axle on which at least one reel core is rotatably arranged, and having a torque-transmission device to transmit a torque from the reel axle to the reel core, the torque-transmission device having a sliding hub element disposed on the reel axle and a core-receiving element which slides in the reel core and which is affixed in the reel core in the rotating and axial directions, the improvement in the winding device comprising the torque-transmission device (**3, 103**) being disposed in the radial direction between the reel axle (**1, 101**) and the reel core (**2, 102**) completely inside said reel core (**2, 102**) wherein the hub element (**4, 104**) is attached to the reel axle (**1, 101**) in the axial direction, the torque-transmission device (**3, 103**) comprising a plurality of torque-transmission modules wherein each torque-transmission module has a hub module (**11–13**) disposed on the reel axle, a core-receiving module (**24–26**) which slides in the reel core and which is affixed in the reel core in the rotating and axial directions, and means (**18–23, 118**) for generating a magnetic coupling field between the hub module (**11–13**) and the core-receiving module (**24–26**) sufficient to transmit a torque from the hub module (**11–13**) to the core-receiving module (**24–26**), said hub modules (**11–13**) and said core-receiving modules (**24–26**) of adjacent torque-transmission modules being screwed together rigidly, respectively, to form said sliding hub element and said core-receiving element, so as to allow for shifting in the axial direction jointly, said generating means including means for changing the magnetic coupling field between each hub module (**11–13**) and its associated core-receiving module (**24–26**) by jointly shifting said core-receiving modules (**24–26**) axially, thereby jointly changing the magnetic coupling between each hub module (**11–13**) and the adjacent core-receiving module (**24–26**).

5,180,116

TAPE CASSETTE REEL HAVING A WING-TYPE UPPER FLANGE

Kiyoshi Urayama, and Masanori Sato, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 7, 1989, Ser. No. 447,373

Claims priority, application Japan, Dec. 28, 1988, 63-331332

Int. Cl.[5] B65H *75/18*

U.S. Cl. 242—71.8 **1 Claim**

1. A tape cassette reel comprising:

a reel hub;

an upper flange having a single pair of opposed fan-shaped portions; and

a lower flange having a disk-shaped configuration, wherein the upper and lower flanges are unitarily molded with the reel hub, wherein the single pair of opposed fan-shaped portions are asymmetrically aligned with respect to a hypothetical line across the diameter of the lower flange.

5,180,117

VIDEO TAPE RECORDER AND/OR REPRODUCER

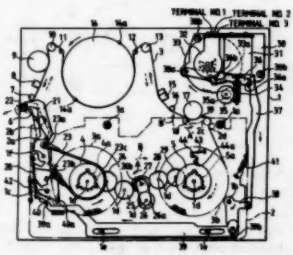
Nobuo Katohno, Mito, and Yoshihiro Shibata, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 14, 1990, Ser. No. 537,640

Claims priority, application Japan, Jun. 14, 1989, 1-149646

Int. Cl.[5] G11B *15/18*

U.S. Cl. 242—189 **3 Claims**



1. A video tape recording and/or reproducing apparatus having a normal mode of operation for recording and/or reproducing a video signal on/from a magnetic tape during a continuous travel in a forward direction and a slow-motion mode of operation for reproducing the video signal from the magnetic tape during an intermittent travel in the forward direction or a reverse direction, said apparatus comprising:

two guide means provided on a chassis base of the apparatus for guiding a travel of the magnetic tape;

a tension pole means for imparting a tension to the magnetic tape during travel thereof;

a tension arm rotatable provided on said chassis base, said tension arm having said tension pole means mounted on a first end thereof and positioning said tension pole means at a position between said two guide means and outside a line extending between said two guide means;

a feed reel base for mounting a tape feed reel;

a tension band having a first end rotatably fixed on a portion of said tension arm and including a main portion wound on said feed reel base;

a band arm rotatably provided on said chassis base, said band arm including a portion on which a second end of said tension band is rotatably fixed;

spring means including a first spring and a second spring, said first spring imparting a first force on said tension arm so as to rotate said tension arm so that said main portion of said tension band is tightened around said feed reel base and said second spring for imparting a second force on said band arm so as to rotate said band arm so that said main portion of said tension band is tightened around said feed reel base, said first and second forces respectively imparted by said first spring and said second spring being such that said feed reel base is urged in directions of rotation counter to each other; and

a capstan motor for rotatably driving said feed reel base through torque transmission means,

wherein, during the slow-motion mode of operation, said feed reel base is selectively driven in accordance with a forward and reverse direction of rotation of said capstan motor so that the magnetic tape is supplied from or taken up onto the tape feed reel under the tension imparted to the magnetic tape by said tension pole means.

5,180,118

MAGNETIC TAPE CASSETTES

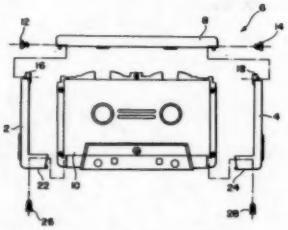
Kimio Tanaka; Shinichi Sato; Takateru Satoh, all of Saku, and Haruo Shiba, Komoro, all of Japan, assignors to TDK Corporation, Japan

Filed Feb. 20, 1990, Ser. No. 482,087

Claims priority, application Japan, Feb. 20, 1989, 1-17890[U]; Feb. 20, 1989, 1-17891[U]; Feb. 20, 1989, 1-17892[U]; Feb. 20, 1989, 1-17893[U]; Feb. 20, 1989, 1-38458

Int. Cl.[5] G11B *23/04*

U.S. Cl. 242—199 **3 Claims**



1. A magnetic tape cassette comprising;

a pair of hubs on which a length of magnetic tape is wound;

a housing including a main body consisting of rectangular upper and lower half housing sections of double-layer structure each consisting of inside and outside layers, said main body having a front end where tape guide rollers and tape guides are installed and a rear end and a pair of lateral ends, said hubs being mounted in said housing;

a rear frame member attached to the rear end of the main body opposite to the front end and having safety lug openings and tape-type detecting openings formed therein,

a pair of side frame members each having an inner surface are attached to the lateral ends of the main body, each said side frame member also has an outer surface capable of directly contacting a holder for a recording-reproducing device,

wherein said inside layers of the upper and lower half housing sections adjacent the lateral ends are formed with steps, and

wherein the outside layers are formed to fall onto the steps, said inner surface of the side frame members engaging the outside layer against the inside layer adjacent the steps.

5,180,119

VERTICAL LIFT SYSTEM THROUGH TANGENTIAL BLOWING OF AIR JETS CHANNELLED OVER THE TOP OF ROTATING CYLINDERS

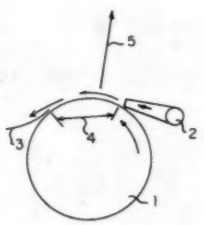
Jean-Paul Picard, 30 rue Thibault, Hull, Quebec, Canada J9A 1H3

Filed Jul. 24, 1991, Ser. No. 735,312

Claims priority, application Canada, Jul. 27, 1990, 2022087

Int. Cl.[5] B64C *23/02*

U.S. Cl. 244—10 **16 Claims**



1. A device for creating lift, which comprises:

a cylinder having an outer surface;

means for rotating the cylinder in a predetermined direction;

first nozzle means having an outlet immediately adjacent to said outer surface for causing a stream of air to impinge generally tangentially directly onto said outer surface of said cylinder in such a direction that said stream of air and said outer surface move in substantially the same direction; and

vane means for carrying said stream of air away from said cylinder;

said vane means for carrying said stream of air away from said cylinder;

said vane means being separated from said outlet from said first nozzle means circumferentially around said outer surface in said predetermined direction of rotation of said cylinder by a distance which defines only a limited area of said outer surface capable in use of creating lift with minimal drag and turbulence; and

said first nozzle means being positioned and orientated relative to said cylinder such that substantially no air issuing from said first nozzle means contacts said surface of said cylinder except in said limited area of said surface.

5,180,120

CONVERTIBLE AIRCRAFT SEAT

Leslie J. Simpson, 3 Deep Acres, Chesham Bois, Amersham, Great Britain, and Brian S. Bayliss, "Jobec", Shiplake Bottom, Peppard, England

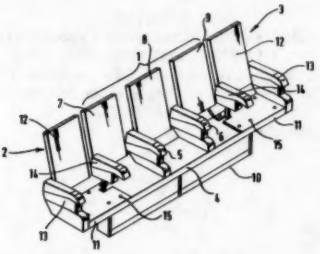
PCT No. PCT/GB89/01060, § 371 Date May 10, 1991, § 102(e) Date May 10, 1991, PCT Pub. No. WO90/02685, PCT Pub. Date Mar. 22, 1990

PCT Filed Sep. 8, 1989, Ser. No. 663,878

Claims priority, application United Kingdom, Sep. 8, 1988, 8821066

Int. Cl.[5] B64D *11/06*

U.S. Cl. 244—118.6 **9 Claims**



1. A convertible aircraft seat comprising,

a seat support frame for anchoring to the floor of an aircraft cabin,

a main seat section mounted on said seat support frame,

said main seat section including a preselected number of sitting positions,

at least one slidable seat section extending outwardly from said main seat section,

said slidable seat section being movable relative to said main seat section between an expanded position and a contracted position,

said slidable seat section including a sitting position located adjacent to a sitting position of said main seat section,

means for moving said slidable seat section onto said seat support frame from said expanded position to said contracted position to combine said sitting position of said slidable seat section with said adjacent sitting position of said main seat section to reduce the total number of sitting positions and form a combined sitting position having a width greater than the width of said adjacent sitting position of said main seat section,

retaining means for holding each seat section in said positions, and

divider means for attachment to said seat support frame at selected intervals corresponding to the number of sitting positions.

5,180,121

AIRCRAFT DOOR HINGE MECHANISM WITH SELECTIVELY TRIGGERABLE ACTUATOR

Eddie D. Banks, Renton; Tomio Hamatani, Seattle, and Chung-Wah F. Wong, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 6, 1991, Ser. No. 696,245

Int. Cl.[5] B64C *1/14*

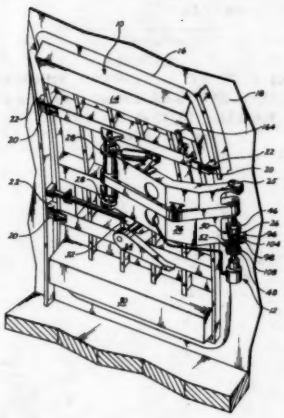
U.S. Cl. 244—129.5 **22 Claims**

1. A hinge assembly for coupling a door to a frame member comprising:

a hinge clevis attached to the frame member;

a hinge attached to the door, said hinge including a hinge pin having a longitudinal axis rotatably fitted to said hinge clevis so that said hinge can pivot relative to said hinge clevis;

a cam assembly including a first cam member securely attached to said hinge clevis adjacent said hinge pin, a second cam member mounted to said hinge pin adjacent said first cam member wherein said second cam member is fixedly mounted to said hinge pin to rotate in unison with said hinge pin and adjustably fitted to said hinge pin to move longitudinally along said hinge pin against said first cam member and said first and second cam members are shaped so that, when said cam members are urged together, said second cam member is rotated relative to said first cam member; and



a selectively triggerable actuator for longitudinally displacing said second cam member against said first cam member so as to cause rotation of said second cam member about said first cam member so that said hinge is pivoted about said hinge clevis.

5,180,122

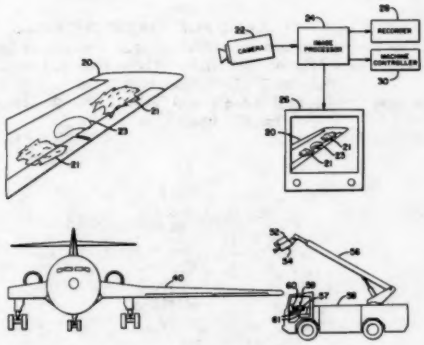
APPARATUS FOR DEICING

Donald J. Christian, Fremont, Calif.; Graham D. Robertson, Orlando, Fla.; James M. Tucci, Campbell, and Michael J. Westcott, San Jose, both of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed May 10, 1991, Ser. No. 698,033

Int. Cl.[5] B64D *15/22*

U.S. Cl. 244—134 F **24 Claims**



1. An apparatus, comprising:

an ice detecting camera, comprising:

a first camera for producing a first signal corresponding to the intensity of reflected light in a first narrow band

centered near a wavelength at which ice has a low reflectence; and

a second camera for producing a second signal corresponding to the intensity of reflected light in a second narrow band centered near a wavelength at which ice has a high reflectence; and

means for receiving the first signal and the second signal, processing the first and second signals, and producing an ice indicator signal.

5,180,123

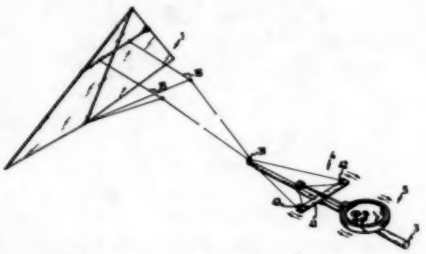
STUNT KITE WITH CONTROL MECHANISM

Chao-Pin Lin, No. 333, Ta-Chih Road, Taichung City, China

Filed Dec. 10, 1991, Ser. No. 804,407

Int. Cl.[5] B64C *31/06*

U.S. Cl. 244—155 A **4 Claims**



1. A stunt kite with a control mechanism comprising:

a) a kite body;

b) a pair of flying lines operatively attached to the kite body;

c) a control mechanism comprising:

i) a control rod; and

ii) a flying line regulator comprising a lever pivotally attached to said control rod; left and right pulleys located at opposite ends of said lever; a central pulley attached to said control rod on an upper side of said lever; and a wire holder located at an end of said control rod such that said pair of flying lines pass around said central pulley from one side of said central pulley, one of said pair of flying lines then passes around said left pulley before passing through said wire holder, the other of said pair of flying lines passes around said right pulley before passing through said wire holder; and,

d) a spool device rotatably attached to said control rod to which said pair of flying lines are attached.

5,180,124

ARTICULATED CLAMP FOR FASTENING PIPES

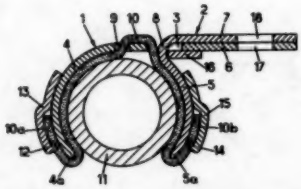
Michel Pascor, Orleans, France, assignor to Equipments Speciaux Pour l'Aviation (ESPA), Brie-Comte Robert, France

Filed Jan. 27, 1992, Ser. No. 825,678

Claims priority, application France, Feb. 8, 1991, 91 01482

Int. Cl.[5] F16C *3/08*

U.S. Cl. 248—74.4 **8 Claims**



1. Clamp for fastening cylindrical elements, particularly pipes (**11**), comprising a frame in two parts, the first (**1**) of which has a first slot (**3**), and the second (**2**), has an angle (**8**), the first and second parts being articulated, one with respect to the other at the level of the first slot and of the angle, characterised in that it further comprises a flexible protective strip (**10**) inserted between the two parts of the frame and the pipe (**11**), and that the first part (**1**) is provided with a second slot (**9**), the protective strip forming a loop on the outside of the frame by passing through the said first and second slots.

5,180,125

APPARATUS FOR LOADING A TRASH BAG WITH DEBRIS FROM THE GROUND

Robert D. Caveney, 18396 Knuth Rd., Los Gatos, Calif. 95030

Filed Aug. 6, 1990, Ser. No. 563,110

Int. Cl.[5] A47L *13/52*

U.S. Cl. 248—99 **6 Claims**

1. An apparatus for loading a trash bag with debris from the ground, comprising:

a frame having a continuous, unbroken perimeter for holding the mouth of said trash bag in an open position;

a first side perpendicularly attached to said frame for accumulating debris to be loaded into said trash bag;

a side structure, having voids to allow the movement of debris onto said first side, perpendicularly attached to said first side for containing accumulated debris on said first side;

legs for supporting said trash bag, said legs attached to said frame and extending from said frame inside said trash bag in a direction away from said first side; and

first handle means attached to said side structure at a point on said side structure farthest from said frame.

5,180,126

LEAF CADDY

Charles O. Bennett, 102 Ridge Rd., Benton, La. 71006

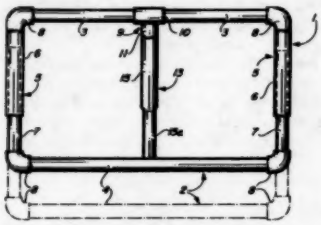
Filed Dec. 24, 1991, Ser. No. 814,419

Int. Cl.[5] B65B *67/04*

U.S. Cl. 248—99 **12 Claims**

1. A leaf caddy comprising a frame for receiving and mounting a trash bag; telescoping means provided in said frame for adjusting said frame to accommodate the trash bag; a substan-

tially T-shaped knuckle pivotally carried by said frame in a friction-fit; and an elongated support having one end removably attached to said knuckle for orienting said frame on the supporting surface and filling the trash bag.



5,180,127

DEVICE FOR ADJUSTABLY SETTING UP AN AERIAL PHOTOGRAPH MEASURING CHAMBER

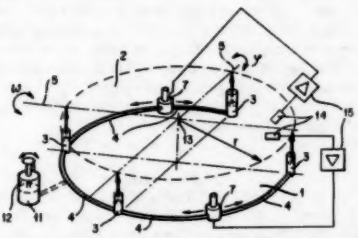
Heinrich Klose, Jena, German Democratic Rep., assignor to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Continuation of Ser. No. 117,127, Nov. 4, 1987, abandoned. This application Jun. 27, 1989, Ser. No. 373,671

Claims priority, application German Democratic Rep., Dec. 1, 1986, 2968584

Int. Cl.[5] F16M *13/00*

U.S. Cl. 248—188.3 **10 Claims**



1. A device for adjustably setting up an apparatus to have a substantially horizontal attitude, comprising at least three hydraulic cylinders arranged to support said apparatus on the pistons of said cylinders for movement about two different horizontal axes, and hydraulic connections between all of said cylinders, said hydraulic connections comprising conduits and interconnecting said cylinders to equally share loads of said apparatus, said hydraulic connections comprising means for controlling pressure in said hydraulic connections to selectively rotate said apparatus about said two axes, said pressure controlling means comprising at least one pump coupled in said hydraulic connections for selectively applying hydraulic pressure in opposite directions in at least one of said connections.

5,180,128

PEGBOARD HOOK MOUNTING ASSEMBLY

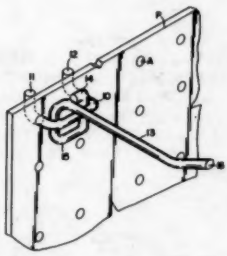
Richard C. Massey, 102 Frontenac Forest, St. Louis, Mo. 63131

Filed Sep. 17, 1991, Ser. No. 760,900

Int. Cl.[5] A47F *7/00*

U.S. Cl. 248—220.4 **5 Claims**

1. Pegboard hook mounting assembly for use in combination with a pegboard having a plurality of holes, such assembly constructed and arranged as a means for accommodating the support of articles from the application of such assembly, said assembly comprising a two-piece complementary component assembly consisting of an approximate U-shaped mounting means configured to fit into at least two holes of a pegboard, and a supporting member which matingly and releasably inserts within the U-shaped member, said supporting member comprising a long rod-like member useful for holding a plurality of articles thereon, said supporting member being securely engaged and firmly positioned upon its mating within the U-shaped mounting means, with said supporting member having a base that extends downwardly therefrom, for biasing



against the pegboard to form support with the U-shaped mounting means to hold the articles supported thereon, said U-shaped mounting means is complementary shaped so as to provide for its connection within the holes of the pegboard during its installation, and integral tabs provided upon the U-shaped mounting means to limit the extent of its insertion within the holes of the pegboard during its installation.

5,180,129

SUSPENSION STRUT CONSTRUCTION

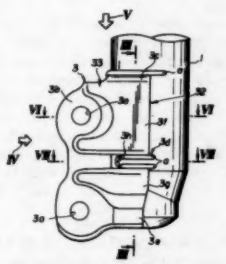
Fumiyuki Yamaoka; Mitsuo Sasaki; Chiharu Nakazawa, and Hiroyuki Sugiyama, all of Kanagawa, Japan, assignors to Atsugi Unisia Corporation, Kanagawa, Japan

Filed Apr. 9, 1991, Ser. No. 682,474

Claims priority, application Japan, Apr. 10, 1990, 2-38893[U]; Feb. 27, 1991, 3-9733[U]

Int. Cl.[5] B60G *15/06*

U.S. Cl. 248—230 **10 Claims**



1. A bracket for use with a suspension strut comprising:

first and second side members, the first and second side members being adapted to extend axially along the external periphery of a tubular member which forms part of the strut;

a connecting member which is formed integrally with the first and second side members;

an essentially U-shaped flange which extends along the first and second side members and the connecting member, said U-shaped flange being formed with at least one pair of connection bolt holes, which are coaxial and located opposite one another;

a first essentially hemi-cylindrically shaped portion formed in the connecting member which is adapted to contact the tubular member and to have an edge welded to the tubular member;

a second essentially hemi-cylindrically shaped portion

formed in the first and second side members which is adapted to contact the tubular member; and

first and second box-like projections in said first and second side members defining spaces between the bracket and the tubular member respectively, the first projection being provided between said first and second hemi-cylindrically shaped portions, the second projections being provided adjacent the second hemi-cylindrically shaped portion opposite the first projection.

5,180,130

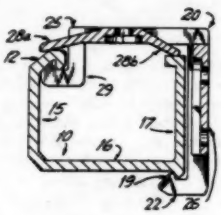
SUPPORTING BRACKET AND HEADRAIL COMBINATION FOR A WINDOW BLIND

Dannie L. McMichael, West Kingston, R.I., assignor to Kenney Manufacturing Company, Warwick, R.I.

Filed Nov. 26, 1990, Ser. No. 618,111

Int. Cl.[5] E06B *9/38*

U.S. Cl. 248—251 **3 Claims**



1. A headrail and mounting bracket combination, comprising:

a generally U-shaped member having a front wall, a bottom wall having a front edge and a rear edge, and a rear wall;

said rear wall extending upwardly from said rear edge of said bottom wall and having a lower edge;

said front wall extending upwardly from said front edge of said bottom wall and having a lip portion extending toward said rear wall;

unitary bracket means for supporting said generally U-shaped member having a top plate and a rear plate connected to said top plate;

hook means associated with said top plate for engagement with said lip portion of said front wall;

securing means extending down from said top plate against the top of said front wall and against the top of said rear wall for urging said hook means into secure engagement with said lip portion; and

latch means associated with said bracket means for engagement with said rear edge of said bottom wall or said lower edge of said rear wall of said generally U-shaped member.

5,180,131

SPRING LOADED JACK STAND

Jeffrey P. Few, West Hills, Calif., assignor to Norco Industries, Inc, Compton, Calif.

Filed Jul. 25, 1991, Ser. No. 736,020

Int. Cl.[5] A47F *5/00*

U.S. Cl. 248—352 **3 Claims**

1. A jack stand comprising:

a base formed at the apex with a hollow, upwardly opening vertical neck of rectangular configuration and one wall of said base formed with a window, said base having a predetermined height;

a flange adjacent to said window and projecting from said neck;

an elongated stem received telescopically in said neck and formed with a tooth rack extending along the side thereof confronting said window, said rack including longitudinally spaced apart horizontally projecting teeth each formed on their bottom sides with a downwardly facing horizontal support surface and on its upper side with a surface sloping upwardly and inwardly from the free end of the tooth at an angle of no greater than 45° from the horizontal and terminating at its outer edge in a corner defining a latch stop;

a pivot pin carried from said flange, adjacent said window;

a crank handle carried from one end of said pivot pin and formed with a hand grasp rod;

a pawl carried from said pivot pin and configured to curve upwardly and inwardly in one direction to terminate in a tip configured to be selectively engageable under the respective support surfaces of said teeth and configured on its bottom side with a limit surface to be disposed in the

path of said teeth and selectively engageable against said respective latch stops; and

a torque spring interposed between said pivot pin and pawl to urge said pawl into engagement between the respective teeth of said rack with a predetermined torque, said teeth and pawl being so configured and arranged that said predetermined torque on said pawl is sufficient to, when said pawl is engaged over the latch stop of a selected tooth and said stem is grasped by a workman and lifted, maintain said limit surface disposed in the path of said latch stop of said selected tooth with sufficient force to enable said base to be carried from said stem.

5,180,132

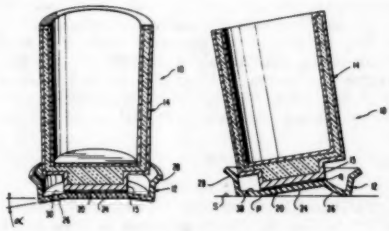
SELF-SETTING SUCTION HOLDER DEVICE

Scott A. Pearson, MIT Room E53-394; Jin Oh, 545 Technology Square #804 JSO, both of Cambridge, Mass. 02139; Richard A. Lethin, 58 Reservoir St., Cambridge, Mass. 02138, and Eric F. Howlett, 362A Shark Ave., Groton, Conn. 06340

Filed Nov. 22, 1991, Ser. No. 796,338

Int. Cl.[5] A45D *42/14*

U.S. Cl. 248—362 **15 Claims**



1. A self-setting suction holder device, comprising:

a) a flexible, circular, substantially planar base member adapted to be placed on a substantially flat, generally horizontal surface,

b) an article holder centrally disposed on the base member and upstanding therefrom, said article holder defining a rigid lower surface having at least a planar outer periphery,

c) means joining said lower surface of the article holder to a

central portion of an upper surface of the base member such that upon any tilting of the article holder an edge of said lower surface bears against and pivots on the upper surface of the base member to attendantly tilt said central portion of the base member upwardly and implement a concave deformation thereof, thereby establishing a suction to adhere the base member and attached article holder to said flat surface, and

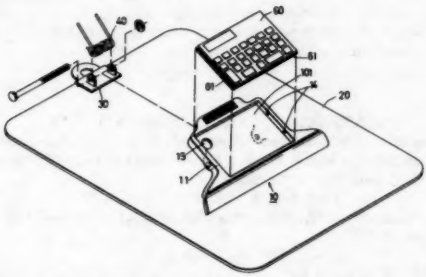
d) means integral with the base member for preventing the establishment of said suction to enable the removal of the article holder from said flat surface.

5,180,133

CLIPBOARD HAVING A CALCULATOR MOUNTED THEREON

Shih-Ho Chang, No. 2-12, Chang-Lu Rd., Chang-Hua City, Taiwan

Filed Dec. 20, 1991, Ser. No. 811,267
Int. Cl.[5] A47B *19/00*
U.S. Cl. 248—452 **6 Claims**



1. A clip board having a calculator mounted thereon, comprising:

a board having an upper side and a lower side;

a clip member having an outside face and an inside face adjacent to said upper side of said board, said outside face having an opening defining a recess therein configured to receive and peripherally surround said calculator; and

means for detachably positioning aid calculator in said recess of said clip member.

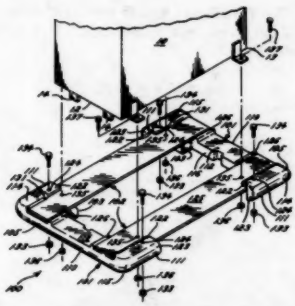
5,180,134

UNIT LOAD CARRIER AND METHOD FOR MANIPULATING A UNIT LOAD

Joseph F. Mallak, 5306 West Patterson, Chicago, Ill. 60641, assignor to Joseph F. Mallak, Chicago, Ill.

Continuation of Ser. No. 9,212, Jan. 30, 1987, abandoned. This application Nov. 27, 1989, Ser. No. 442,496
Int. Cl.[5] B60P *7/00*
U.S. Cl. 248—544 **22 Claims**

1. A unit load carrier comprising a base, support means located below said base for supporting at least a portion of the weight of the unit load, mounting means for releasably mounting said support means to said base at least one collapsible fluid cell located below said base, said fluid cell being collapsible under at least a portion of the weight of the unit load and in a direction perpendicular to a foundation surface, and control means for controlling the rate at which fluid is released from the cell, said support means, when mounted to said base, being in weight-bearing relationship to the base and unit load, said fluid cell being integral with said support means and not being in weight-bearing relationship to the base and unit load when the support means is mounted to the base, said fluid cell being collapsible so that upon release of said support means from weight-bearing relationship to said unit load a sufficient portion of the weight of said unit load is received by said fluid cell causing the control means to controllably release fluid from the fluid cell and said fluid cell to collapse sufficiently to lower said unit load to the foundation surface; said collapsed fluid cell



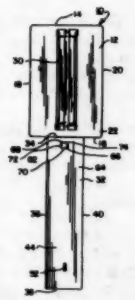
being removable from underneath said unit load when said load is at rest on the foundation surface.

5,180,135

PICTURE HANGER LOCATING DEVICE

Carey B. Hindall, 6218 Inverurie Dr., Dublin, Ohio 43017

Filed Dec. 16, 1991, Ser. No. 808,222
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—544 **6 Claims**



1. A picture hanger locating device which comprises:

a main body member having a top surface, a bottom surface, a pair of side surfaces, a substantially flat back side adapted to engage a wall and a front side;

a handle attached to the front side of said body member;

a movable downwardly depending positioning arm having an upper end and a lower end movably attached to the bottom surface of said body member such that the lower end of said arm is movable between a rest position and a marking position;

said positioning arm having a front surface and a rear surface;

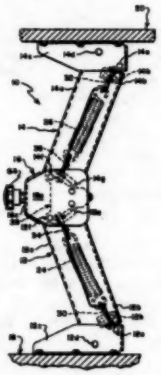
wherein the plane of said rear surface of said positioning arm is intermediate the planes of said front side and said back side of said body member when said arm is at said rest position;

marking means for marking the location of a picture hanger when said arm is at said marking position fixedly attached to the lower end of said positioning arm;

wherein said marking means is located between said positioning arm rear surface and the plane of said back side of said main body member when the lower end of said arm is at said rest position and extends beyond the plane of said back side of said main body member when the lower end of said arm is at said marking position; and

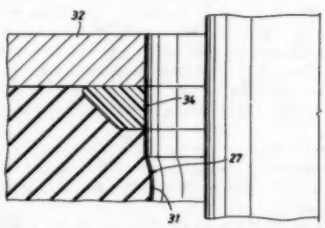
mounting means for mounting a picture attached to the front surface of said positioning arm.

5,180,136
COUNTERBALANCE MECHANISM
Alan Sova, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.
Filed Aug. 19, 1991, Ser. No. 746,880
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—576 **8 Claims**



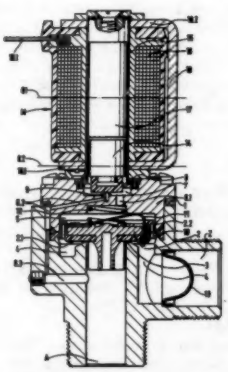
1. A counterbalance mechanism comprising:
a pair of parallelogram linkages having interconnected adjacent ends and distal ends;
a pair of counterbalance spring means having adjacent ends and distal ends connected one to each of said distal ends of said linkages;
adjustment means carried by said interconnected adjacent ends for simultaneously controlling the positions of said adjacent ends of said spring means for adjusting the counterbalance effects of said spring means on said linkages.

5,180,137
RAM TYPE BLOWOUT PREVENTER HAVING IMPROVED RAM FRONT PACKINGS
Douglas W. Carlson, and Stephen P. Simons, both of Kingwood, Tex., assignors to Hydril Company, Houston, Tex.
Filed Oct. 2, 1991, Ser. No. 770,181
Int. Cl.[5] E21B *33/06*
U.S. Cl. 251—1.3 **16 Claims**



1. A blowout preventer, comprising
a body having a vertical bore to receive a well pipe and opposed guideways extending from the bore, and
rams reciprocable within the guideways for opening and closing the bore,
each ram including
a body slidably in a guideway, and
means carried by the ram body for sealing with respect to the pipe and the opposed ram as well as with respect to the preventer body, when the rams are moved to closed position,
said sealing means including
a ram front packing received within a recess across the front face of the ram body and having
a seal strip of elastomeric material, and
a seal strip of non-elastomeric, relatively rigid material above the elastomeric seal strip,
top and bottom metal plates respectively above and below the seal strips for preventing extrusion of the seal strips between the front ends of the ram bodies,
the hardness of the non-elastic, relatively rigid material being intermediate that of the metal plates and elastomeric material,
the front ends of the ram body, seal strips and metal plates having vertical recesses therein of essentially the same radius to fit about the pipe,
the elastomeric seal strip including portions behind the metal plates, so that, upon engagement of the front ends of the plates with one another during closing movement of the rams, the front ends of the seal strips are urged tightly against one another and the pipe, and
said non-elastomeric seal strip being free to slide with respect to the top metal plate.

5,180,138
SOLENOID CONTROLLED SERVO VALVE
Hermann Moldenhauer, Düsseldorf, Fed. Rep. of Germany, assignor to Firma A.U.K. Muller GmbH & Co. KG, Dusseldorf, Fed. Rep. of Germany
Filed Feb. 4, 1992, Ser. No. 831,136
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1991, 4103777
Int. Cl.[5] F16K *31/12*
U.S. Cl. 251—30.05 **8 Claims**



1. A servo valve comprising: a housing having a fluid intake and a fluid outlet; a differential piston mounted for back and forth movement in the housing; a disk mounted on the piston; means forming a compression chamber in the housing at one end of the piston in communication with the fluid intake; an outlet seat facing the disk for providing communication between the compression chamber and the fluid outlet; means forming an eccentric control bore extending through the piston; means forming a control chamber at the other end of the piston in communication with the fluid outlet through a depressurization channel and with the compression chamber through the control bore; a bistable solenoid valve for controlling the servo valve comprising a coil on the housing, a tube extending through the coil, an armature mounted for back and

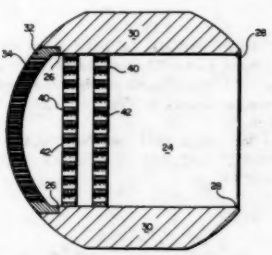
forth movement in the tube, means forming a solenoid valve chamber at one end of the tube, a solenoid valve seat in the chamber, a gasket mounted on one end of the armature facing the solenoid valve seat, a head accommodated in the tube and facing the other end of the armature, a yoke surrounding the ends of the coil, and wherein the depressurization channel extends through the solenoid valve chamber and solenoid valve seat and is closed off by the gasket; wherein the armature travels freely back and forth in the tube, wherein the coil is responsive to an opening pulse applied thereto to move the armature into a position at the head, wherein the head, the armature, and the yoke are all made of soft-magnetic material having a coercive field strength which is lower than 400 A/m, wherein the coercive field strength of the material of the armature and head is lower than that of the material of the yoke, and wherein the weight of the armature matches the magnetic force retaining the armature in the position at the head, the magnetic force being determined by the coercive field strength of the soft-magnetic material.

5,180,139

ROTARY BALL FLUID CONTROL VALVE WITH NOISE ATTENUATOR

Douglas P. Gethmann, Gladbrook, and Allen C. Fagerlund, Marshalltown, both of Iowa, assignors to Fisher Controls International, Inc., Clayton, Mo.

Filed Oct. 15, 1991, Ser. No. 775,615
Int. Cl.[5] F16K *47/02, 47/04*
U.S. Cl. 251—127 **5 Claims**



1. A rotary ball/noise attenuator for a fluid control valve controlling a fluid stream and attenuating noise in said fluid stream, said rotary ball comprising:

a spherical ball rotatable control member;

an elongated bore in the ball for receiving fluid at an inlet bore end and communicating the fluid to an outlet bore end;

a spherically shaped dome mounted to said ball and covering said inlet bore end, including a plurality of apertures through said spherically shaped dome for restricting the flow of fluid through said dome and entering said bore; and

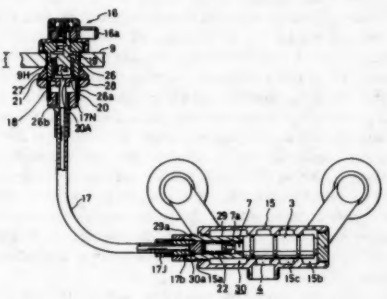
said noise attenuation being substantially constant over the full extent of said valve operation between the initial opening to the fully opened positions.

5,180,140

HOT/COLD WATER MIXING FAUCET AND MOUNTING STRUCTURE THEREFOR

Osamu Araki, Tokoname, Japan, assignor to Inax Corporation, Tokoname, Japan

PCT No. PCT/JP90/00961, § 371 Date Mar. 11, 1991, § 102(e) Date Mar. 11, 1991, PCT Pub. No. WO91/02127, PCT Pub. Date Feb. 21, 1991
PCT Filed Jul. 27, 1990, Ser. No. 663,954
Claims priority, application Japan, Aug. 3, 1989, 1-201850; Aug. 10, 1989, 1-94705[U]; Aug. 18, 1989, 1-97044[U]
Int. Cl.[5] F16K *31/46, 31/64*
U.S. Cl. 251—291 **8 Claims**



1. A hot/cold water mixing faucet device comprising:

a control mechanism for controlling temperature of hot water to be spouted and having a control input end,

a faucet body housing the control mechanism, said control input end of said control mechanism protruding from one end of the faucet body;

a cable having first and second ends,

a sink having a hole, and

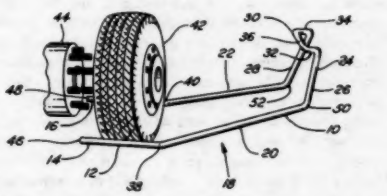
a control knob having a cylindrical head to be inserted into the hole of the sink and a joint, said joint being removably connected to one of the control input end of said control mechanism and the first end of the cable such that when the control knob is to be located adjacent the control mechanism, the joint of the control knob is directly engaged with the control input end, and when the control knob is to be located away from the control mechanism, the joint of the control knob is engaged with the first end of the cable and the second end of the cable is engaged with the control input end.

5,180,141

TOOL FOR HANDLING WHEEL ASSEMBLIES AND METHOD FOR MANIPULATION THEREOF

Thomas R. Hunt, 755 Park, Lincoln Park, Mich. 48146

Continuation of Ser. No. 585,806, Sep. 20, 1990, abandoned. This application Jan. 24, 1992, Ser. No. 826,269
Int. Cl.[5] B66F *3/00*
U.S. Cl. 254—131 **5 Claims**



1. A tool for removing, maneuvering, and replacing a wheel-

tire assembly which is demountably attached to a vehicle axle, comprising:

a handle section including an elongated handle bar and a pair of handle members, the handle bar having opposite ends, said opposite ends including portions transverse to the handle bar, each of the handle members having a first end connected to one of the transverse portions of the opposite ends of the elongated handle bar in a manner transverse to both the handle bar and the transverse portions, said handle members also having a second end; and

a pair of elongated members, each elongated member being respectively connected to the second end of one of the handle members so that the pair of elongated members is offset from the handle bar by the distance of the handle members, and each of the elongated members being offset from each other by the distance of the handle bar;

each elongated member having a wheel support member for supporting the wheel-tire assembly during the removing and replacing thereof; and a leverage member for providing a leverage arm in conjunction therewith, the wheel support members lying in a plane generally parallel to a plane containing the handle bar and the transverse portions, such that the handle section may support one side of the wheel-tire assembly and the elongated members may support another side of the wheel-tire assembly when a peripheral edge of the wheel-tire assembly is resting on the handle members to prevent rotation of the wheel-tire assembly;

said elongated handle bar being graspable by the entire palm of the operator's hand for applying a motive force to the tool without injury to the operator's hand.

5,180,142

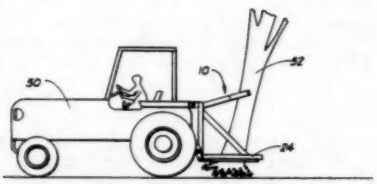
DEVICE FOR UPROOTING TREES

Forrest D. Nowlin, Rte. 1, box 44, Farris, Okla. 74542

Continuation of Ser. No. 599,313, Oct. 17, 1990, abandoned. This application May 15, 1991, Ser. No. 702,358

Int. Cl.[5] E21B *19/00*

U.S. Cl. 254—132 **13 Claims**



1. A device for uprooting trees, comprising:

a tree engaging member for engaging the trunk of the tree to be uprooted, the tree engaging member comprising a pair of rigid, laterally diverging arms; and

a frame for supporting the tree engaging member, the frame comprising a horizontal portion and a vertical portion for connecting the device to a three-point hitch on a vehicle, the tree engaging member being rigidly attached to the frame so as to be non-movable with respect to the frame, wherein the tree engaging member is supported substantially parallel to the ground when the frame is attached to the vehicle, and wherein the entire frame is rigid and non-jointed so that there is substantially no movement within the frame relative to the point of attachment to the vehicle or to the tree engaging member during operation of the device.

5,180,143

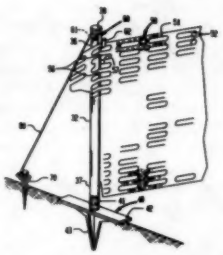
PORTABLE SPORT BOUNDARY FENCE

William S. Brower, Southern Pines, N.C., assignor to Belvedere Sports, Tiburon, Calif.

Filed Jan. 28, 1991, Ser. No. 646,675

Int. Cl.[5] F04H *17/16*

U.S. Cl. 256—24 **5 Claims**



1. A portable fence used to establish sport boundaries, said fence comprising:

a plurality of hollow, tubular posts, each having a top and a base,

a plurality of post anchors, each of said anchors having a vertical stem for slidably and removably engaging the base of one of said hollow posts, a horizontal plate supporting said vertical stem, said horizontal plate having sufficiently large surface area for a user to be able to press downwardly on said horizontal plate with a hand or foot, and a tapered, pointed tip extending downwardly from said horizontal plate,

said posts being sufficiently thin at their bases, and said vertical stems supporting said posts being sufficiently short that, when impacted by a player, the post readily bends and/or breaks away at its base to avoid injury to said player,

perforated netting adapted to extend between said posts, and

connecting means carried by each of said posts to removably attach said netting to said posts.

5,180,144

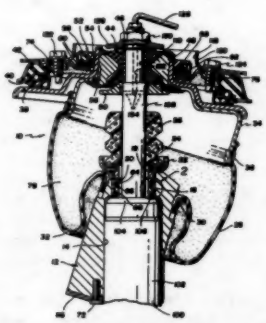
AIR SPRING MODULE FOR A DAMPER

Richard A. Hellyer, Huber Heights; James R. Wagner; James M. Pees, both of Centerville, all of Ohio, and Detlef Lohmann, Paris, France, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 3, 1991, Ser. No. 752,366

Int. Cl.[5] F16F *9/04, 9/43;* **B60G** *17/00*

U.S. Cl. 267—64.19 **13 Claims**



1. A vehicular suspension assembly comprising:

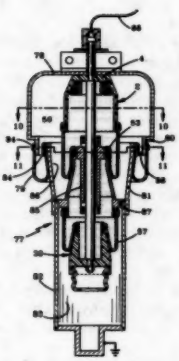
(a) a hydraulic damper having a telescopic piston rod projecting from a neck;
(b) a profiled contact piston;
(c) a stepped bore through the contact piston including a larger diameter portion for receiving the damper and a small diameter portion for receiving the neck and the piston rod;
(d) a retaining sleeve secured to the small diameter portion of the contact piston;
(e) seal means provided in a first circumferential groove on the neck;
(f) a retainer ring provided in a second circumferential groove on the neck;
(g) a groove provided in an inner surface of the retaining sleeve for receiving the retainer ring when the contact piston is mounted on the damper so that no part of the retainer ring is exposed to an outer surface of the contact piston;
(h) an electomeric sleeve air sleeve sealed at a lower end to the contact piston and sealed at an upper end to a canister; and
(i) means for rotatably mounting the canister to a vehicular body.

5,180,145

VIBRATION DAMPING DEVICE

Isao Watanabe, Iruma, Japan; John D. Rensel, Tallmadge, and David A. Weitzenhof, Akron, both of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 30, 1991, Ser. No. 707,733
Int. Cl.[5] F16F 9/04
U.S. Cl. 267—64.24 **14 Claims**



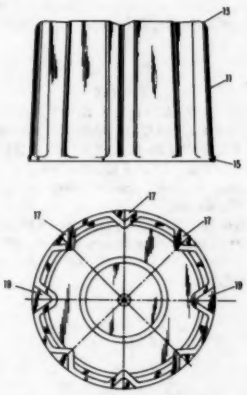
1. A vibration damping device including a first housing having a hollow interior and formed with an open end; a rigid intermediate member having a tapered outer wall converging from an open end of said intermediate member toward the open end of the first housing and forming a tapered hollow interior within said intermediate member, and having an inner wall located within the tapered hollow interior forming a bore which extends through said hollow interior toward the open end of said intermediate member and terminating in an extended end; a piston having a tapered outer surface and formed with a recess; a rigid member extending between and connecting the first housing to the piston, said rigid member extending through the bore of the inner wall of the intermediate member forming an orifice therebetween, and extending into the piston recess; a first elastomeric sleeve extending between and sealingly connected to the open end of the first housing and an adjacent end of the intermediate member and forming a first fluid chamber in combination with the interior of the first housing, said first sleeve having a rolling lobe extending along the tapered outer wall of the intermediate member; a second elastomeric sleeve extending between and sealingly connected to another end of the intermediate member and an adjacent end of the piston, and forming a second fluid chamber in combination with the hollow interior of the intermediate member, said second chamber communicating with the first chamber through the orifice, and said second sleeve having a rolling lobe extending along the piston; and wherein the tapered outer wall of the intermediate member moves within the interior of the first housing when the damping device moves towards a jounce condition, and the tapered outer surface of the piston moves within the hollow interior of the intermediate member and the extended end of the bore forming inner wall of the intermediate member moves within the recess of the piston when the damping device moves toward a rebound condition.

5,180,146

ROLLING PISTON FOR A ROLL BELLOWS OF A ROLL BELLOWS-TYPE PNEUMATIC SHOCK ABSORBER

Eckhard Schneider, and Hubertus Gawinski, both of Lehrte, Fed. Rep. of Germany, assignors to Continental Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Mar. 15, 1991, Ser. No. 670,307
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1990, 4008187
Int. Cl.[5] F16F 9/04
U.S. Cl. 267—64.27 **6 Claims**



1. A pot-shaped rolling piston for a roll bellows-type pneumatic shock absorber, with a rolling crease of a roll bellows of said roll bellows-type pneumatic shock absorber being supported at an outer mantle surface of an annular wall of said rolling piston during a shock absorbing movement, comprising:

Stiffening grooves provided on said outer mantle surface in a longitudinal direction of said rolling piston wherein a first set of said stiffening grooves has a greater depth than a second set of said stiffening grooves and wherein, at a bottom section of said rolling piston, said stiffening grooves are provided with end sections in said outer mantle surface, with said end sections closing said stiffening grooves and extending to a periphery of said rolling piston corresponding to a maximum diameter thereof.

5,180,147

VIBRATION DAMPER

Joachim Andersson, Anderstorp, and Bengt-Göran Gustafsson, Bredaryd, both of Sweden, assignors to Forsheda AB, Sweden

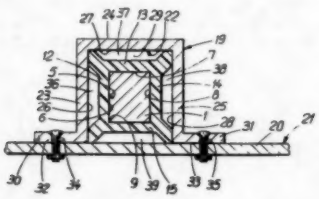
PCT No. PCT/EP90/00488, § 371 Date Feb. 26, 1991, § 102(e) Date Feb. 26, 1991, PCT Pub. No. WO91/00967, PCT Pub. Date Jan. 24, 1991

PCT Filed Jul. 11, 1990, Ser. No. 651,406

Claims priority, application Sweden, Jul. 11, 1989, 8902502

Int. Cl.[5] F16F *7/00*

U.S. Cl. 267—136 **16 Claims**



1. A vibration damper assembly for attachment to a surface of an object to dampen vibrations in said surface comprising locating means forming a casing with an opening and an internal cavity defined by a plurality of inwardly defacing vibration-transmitting support walls whereby when said locating means is attached to said surface, said cavity is enclosed within said plurality of inwardly facing support walls and said surface, said locating means comprising a rigid material, an oscillating body moveably mounted within said cavity, and a damping element comprising a unitary structure and having an elastic material and at least partially enclosing said oscillating body, said damping element including spacing means projecting from said damping element towards corner regions of said cavity formed by said inwardly facing support walls thereby forming interstices between said damping element and said inwardly facing support walls, said spacing means comprising said elastic material.

5,180,148

FLUID-FILLED ELASTIC MOUNT HAVING TWO ORIFICES PASSAGES ONE OF WHICH IS SELECTIVELY OPENED AND CLOSED BY MEANS OF VACUUM PRESSURE

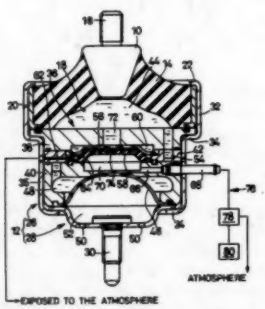
Atsuhi Muramatsu, Komaki, Japan, assignor to Tokai Rubber Industries, Ltd., Japan

Filed Jan. 31, 1992, Ser. No. 828,580

Claims priority, application Japan, Feb. 4, 1991, 3-35599

Int. Cl.[5] F16F *13/00, 9/08*

U.S. Cl. 267—140.14 **15 Claims**



1. A fluid-filled elastic mount for flexibly connecting two members, comprising:

a first support member and a second support member which are respectively fixed to the two members to be flexibly connected, and which are spaced apart from each other in a load-receiving direction in which vibrations are applied to the elastic mount;

an elastic body interposed between said first and second support members for elastically connecting the first and second support members;

a partition structure supported by said second support member and extending in a direction substantially perpendicular to said load-receiving direction;

said elastic body at least partially defining a pressure-receiving chamber disposed on one of opposite sides of said partition structure on the side of said first support member, said pressure-receiving chamber being filled with a non-compressible fluid, a pressure of said fluid in said pressure-receiving chamber changing due to elastic deformation of said elastic body upon application of the vibrations in said load-receiving direction;

a first flexible diaphragm cooperating with said partition structure to define a first equilibrium chamber which is filled with said non-compressible fluid, said first flexible diaphragm being elastically deformable so as to permit volume changes of said first equilibrium chamber to absorb pressure changes of said fluid in said first equilibrium chamber;

means for defining a first orifice passage which communicates with said pressure-receiving chamber and said first equilibrium chamber so as to permit flow of said fluid therebetween;

a second flexible diaphragm cooperating with said partition structure to define a second equilibrium chamber which is filled with said non-compressible fluid, said second flexible diaphragm being elastically deformable so as to permit volume changes of said second equilibrium chamber to absorb pressure changes of said fluid in said second equilibrium chamber;

means for defining a second orifice passage which communicates with said pressure-receiving chamber and said second equilibrium chamber so as to permit flow of said fluid therebetween, said second orifice passage having a ratio of a cross sectional area thereof to a length thereof, which ratio is higher than that of said first orifice passage;

a flexible partition wall disposed on one of opposite sides of said second flexible diaphragm remote from said second equilibrium chamber, said flexible partition wall cooperating with said second flexible diaphragm to define therebetween an air chamber which is exposed to the atmosphere to permit elastic deformation of said second flexible diaphragm;

biasing means for applying a biasing force to said second flexible diaphragm, thereby forcing said second flexible diaphragm to close an opening of said second orifice passage;

said flexible partition wall partially defining a fluid-tightly enclosed operating chamber which is separated from said air chamber by said flexible partition wall; and

pressure control means for applying a vacuum pressure to said operating chamber to draw said second flexible diaphragm away from said opening of said second orifice passage against said biasing force of said biasing means, thereby opening said second orifice passage for fluid communication with said second equilibrium chamber.

5,180,149

BRAKE CYLINDER PISTON SPRING

Michael S. Given, and Joe W. Wright, both of Xenia, Ohio, assignors to Twist Inc., Xenia, Ohio

Filed Dec. 5, 1991, Ser. No. 802,556

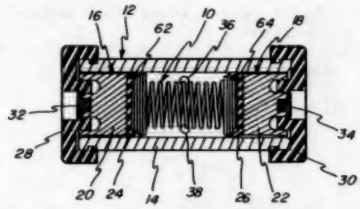
Int. Cl.[5] F16F *1/06, 1/08*

U.S. Cl. 267—180 **4 Claims**

1. A coil spring or use in a brake cylinder having a cylindrical inner wall and opposing piston elements having frustonconical recesses, said spring comprising:

a body portion formed f a length of wire in the shape of a helix defining a longitudinal axis of said spring and including a plurality of coils wherein adjacent coils are spaced from each other;

opposing first and second end portions formed of said length of wire at opposing ends of said body portion, each said end portion including a plurality of coils wherein adjacent coils are in contact with each other to limit compressive movement of said coils forming said end portions relative to each other;



said coils forming said end portions each defining a conical helix shape decreasing in diameter in a direction away from said body portion for engaging within frustoconical recesses in the opposing brake cylinder piston elements; and

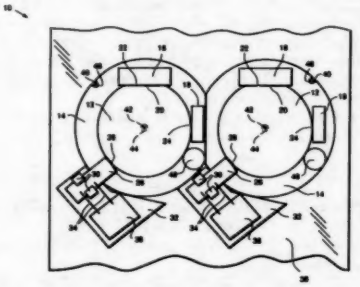
wherein said coils forming said end portions define a maximum spring diameter at each end of said spring greater than a diameter defined by said body portion such that said end portions prevent contact between said body portion and the cylindrical inner wall of the brake cylinder containing said spring along the length of said body portion.

5,180,150

APPARATUS FOR PROVIDING CONSISTENT REGISTRATION OF SEMICONDUCTOR WAFERS

Joseph P. Prusak, Huntington, and Anthony Bassaro, Bethel, both of Conn., assignors to Hughes Danbury Optical Systems, Inc., Danbury, Conn.

Filed Jan. 24, 1992, Ser. No. 825,520
Int. Cl.[5] B25B *1/20*
U.S. Cl. 269—254 R **22 Claims**



1. An apparatus for providing a consistent registration of a semiconductor wafer undergoing interdependent process steps in a plurality of different processing instruments, said apparatus comprising:

means for providing a support upon which said semiconductor wafer is registered;

means for providing a registration to a flat of said semiconductor wafer;

means for providing a registration to a first point along a circumference of said semiconductor wafer; and

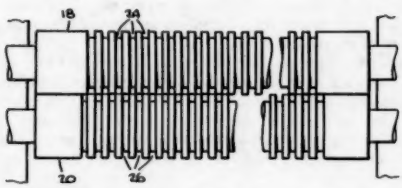
means for providing a registration to a second point along said semiconductor wafer circumference, such that said semiconductor wafer is forced against said flat registration means and said first point registration means by a force provided by said second point registration means, said second point registration means being adjustable to accommodate diameter variations between successively processed semiconductor wafers.

5,180,151

GROOVED PAPER FOLDING ROLLERS

George N. Branecky, Bethel, and John F. Pezzuti, Naugatuck, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 30, 1991, Ser. No. 814,523
Int. Cl.[5] B42C *1/00*; B31F *1/00*
U.S. Cl. 270—45 **6 Claims**



1. A buckle chute folder for folding one or more sheets of paper, comprising:

a buckle chute; and

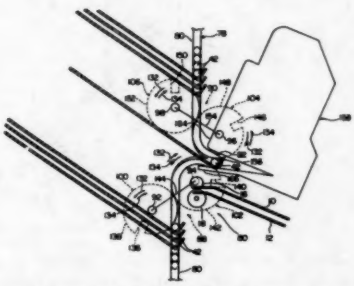
a pair of folding rollers situated downstream of said buckle chute, each of said folding rollers having a plurality of circumferential grooves extending perpendicular to the axis of said roller, and wherein the grooves of one roller are offset with respect to the grooves of the other roller.

5,180,152

SORTER

Yoichiro Irie, Suita, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 7, 1991, Ser. No. 788,877
Claims priority, application Japan, Nov. 15, 1990, 2-307136
Int. Cl.[5] B42B *2/00*; B65H *39/02*
U.S. Cl. 270—53 **4 Claims**



1. A sorter provided with a plurality of vertically arranged bin trays, the bin trays respectively having a widthwise projecting trunnion in at least one side thereof, a supporting frame having formed therein a trunnion guide passage which defines a moving passage for the trunnions, a transfer mechanism for moving the trunnions successively one by one through the moving passage and spacing adjacent bin trays from each other successively vertically at their upstream ends to form a sheet receiving opening between them,

the transfer mechanism being composed of a cam means

including two pairs of rotating cam plates which are vertically arranged and a driving means for driving the cam means,

at least the uppermost and lowermost rotating cam plates of each of the two pairs of rotating cam plates respectively having at least one trunnion receiving groove extending radially and being open at its radially outside end and an outer circumferential cam surface extending continuously in the circumferential direction excepting a site corresponding to the trunnion receiving groove,

the outer circumferential cam surface being a convoluted surface whose radius increases progressively in a given rotating direction,

the uppermost rotating cam plate and the lowermost rotating cam plate being rotated synchronously in opposite directions to each other so that the vertical cam lengths defined by their outer circumferential cam surfaces may be constant; wherein

the moving passage for the trunnions includes a main portion and a by-pass portion detouring upstream or downstream from the main portion,

each pair of the rotating cam plates are arranged such that a straight line connecting their rotating central axes crosses the moving passage for the trunnions and that the rotating cam plates making the pair move toward or away from each other at a part at which the straight line connecting their rotating central axes crosses the moving passage for the trunnions,

when the trunnion of each of the bin trays is moved along the main portion and the by-pass portion, each of the bin trays and sheets collected thereon are caused to move.

5,180,153

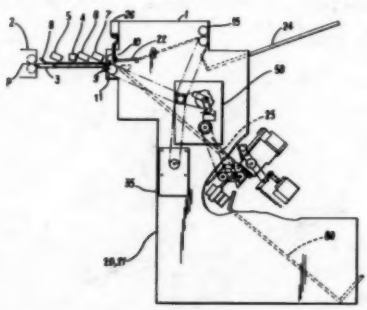
METHOD AND APPARATUS FOR MAINTAINING CONFIDENTIAL PRINTED-SHEET OUTPUT

Harold W. Gegenheimer, 2 Eldredge St., Mystic, Conn. 06355, and Webster C. Roberts, Noank, Conn., assignors to Harold W. Gegenheimer, Mystic, Conn.

Continuation-in-part of Ser. No. 665,171, Mar. 7, 1991, abandoned. This application Nov. 7, 1991, Ser. No. 788,876

Int. Cl.[5] B42B *1/02*

U.S. Cl. 270—53 **32 Claims**



1. A method for providing confidentiality for information produced by electrographic devices comprising the steps of:

receiving sheets having non-confidential information or sheets having confidential information, wherein said sheets having confidential information includes at least a last sheet having a confidential code and no confidential data;

detecting said last sheet of said sheets having confidential information;

delivering sheets along a sheet path comprising an assembly tray and a storage tray;

accumulating said sheets delivered to said assembly tray into a set of sheets containing non-confidential information, or a set of sheets containing confidential information;

delivering said sets from said assembly tray to said storage tray, after said last sheet of a set of sheets is delivered to said assembly tray; and

binding said set of confidential sheets on its sides as said set is delivered from said assembly tray to said storage tray.

5,180,154

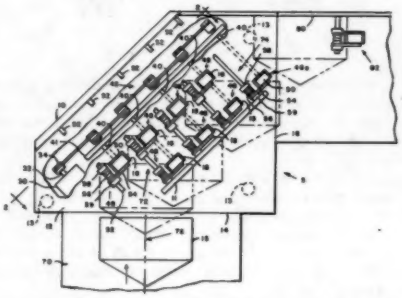
METHOD AND APPARATUS FOR CHANGING THE DIRECTION OF MOTION OF FLAT ARTICLES

Shahzad H. Malick, Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 608,512, Nov. 2, 1990, abandoned. This application May 5, 1992, Ser. No. 880,467

Int. Cl.[5] B65H *5/00*

U.S. Cl. 271—2 **17 Claims**



1. An apparatus for changing the direction of travel of a flat article along a single path, comprising:

a deck mounted on a frame, said deck having a first side for receiving an article from a first direction along a single path and a second side for conveying the article in a second direction along said single path which forms an acute angle equal to or less than forty-five degrees (45°) with the first direction;

means for conveying the article over said deck in said second direction;

a registration wall fixedly positioned downstream from said second direction conveying means adjacent a third side of said deck, said registration wall extending a third direction along said single path whereby said registration wall is at a right angle to the first direction, wherein said leading edge of the article is driven against said registration wall after the article has been disengaged by said second direction conveying means; and

means for conveying the article in said third direction after said article is against said registration wall.

5,180,155

APPARATUS FOR SEPARATING AND GRIPPING STACKED SHEETS

Toshimasa Asai, Chofu, Japan, assignor to Juki Corporation, Tokyo, Japan

Filed Jun. 28, 1991, Ser. No. 722,706

Claims priority, application Japan, Jun. 28, 1990, 2-171146

Int. Cl.[5] B65H *3/30*

U.S. Cl. 271—21 **7 Claims**

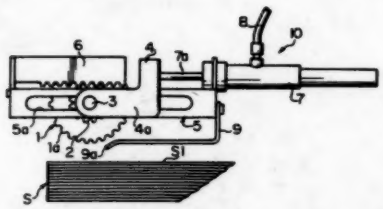
1. An apparatus for picking an uppermost sheet from a stack of sheets comprising:

a rotatable take-up roller for pressing the stack to separate the uppermost sheet;

a support member for rotatably supporting said take-up roller;

a guide member slidably engaged with said support member for guiding movement of said support member;

drive means connected to said support member for slidably moving said support member with respect to said guide member, said drive means located between said take-up roller and said guide member, and in operative engagement with said take-up roller and said guide member



whereby sliding movement of said support member with respect to said guide member is translated into rotational movement of said take-up roller; and

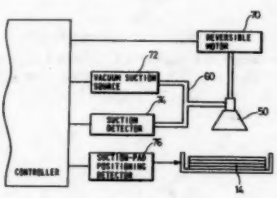
an elastic retainer plate for clamping said separated sheet in cooperation with said take-up roller, said retainer plate having one end secured to said guide member.

5,180,156

METHOD OF FEEDING SHEETS USING A CONTROLLED SUCTION PAD MOVEMENT

Toshitaka Matsui; Nobuyuki Torisawa, and Yoshiyuki Yazawa, all of Minamiashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 3, 1991, Ser. No. 695,133
Claims priority, application Japan, May 7, 1990, 2-117127
Int. Cl.[5] B65H *3/08*
U.S. Cl. 271—103 **7 Claims**



1. A method of feeding sheets one by one, comprising the following five steps of:

a first step of displacing a suction pad at a first speed towards stacked sheets;

a second step of reducing the speed of said suction pad to a second speed so as to cause said suction pad to approach said stacked sheets at said second speed without pressing the stacked sheets;

a third step of detecting while moving at said second speed whether or not said suction pad attracts an uppermost sheet of said stacked sheets;

a fourth step of stopping said suction pad from being moved toward said stacked sheets immediately upon detecting that said suction pad has attracted said uppermost sheet; and

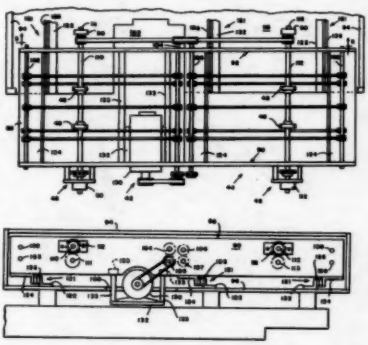
a fifth step of displacing said suction pad away from said stacked sheets until said suction pad reaches a desired position.

5,180,157

SELF CONTAINED TRANSPORT APPARATUS WITH DRAWER MOUNT

Thomas M. Helit, Bethel; Kenneth W. Lowell, Farmington, and Karen P. Synnett, Seymour, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 30, 1991, Ser. No. 816,440
Int. Cl.[5] B65H *7/00*
U.S. Cl. 271—256 **6 Claims**



1. An apparatus for conveying sheets of paper along a paper path from an upstream conveying device to a downstream conveying device, comprising:

an outer frame having an inlet end for connection to an upstream conveying device and an outlet end for connection to a downstream conveying device, the outer frame having a hollow interior and an opening in each of said inlet and outlet ends for conveying sheets there through;

a drawer frame slidably mounted to said outer frame, said drawer frame being slidable through an open side of said outer frame between a closed position within said outer frame to an open position outside said outer frame;

means mounted in said drawer frame for conveying along a paper path sheets of paper received from the upstream conveying device to the downstream conveying device, said conveying means including drive means for driving said conveying means, said drawer frame having an opening at each end for conveying sheets there through;

wherein said conveying means is operational when said drawer frame is in said closed position and said paper path within said drawer frame is accessible when said drawer frame is in said open position.

5,180,158

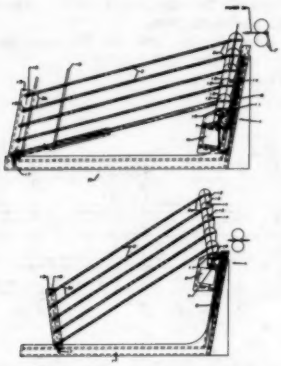
MOVING BIN-SET SORTER

Peter M. Coombs, Tustin, Calif., assignor to Gradco (Japan) Ltd., Tokyo, Japan

Filed Jan. 21, 1992, Ser. No. 823,401
Int. Cl.[5] B65H *39/10*
U.S. Cl. 271—293 **4 Claims**

1. A moving tray sheet receiver for receiving successive sheets of paper from the sheet outlet of a host copier, printer or facsimile machine comprising: a base support, a plurality of elongated and vertically spaced sheet receiving trays extending horizontally above said base support, said trays having first ends remote from the sheet outlet of the host machine supported on said base support for pivotal and longitudinal movement, and operating means at the sheet inlet ends of said trays adjacent to the host machine operable to sequentially raise and lower the sheet inlet ends of said trays sequentially and as a set between a lower position at which the uppermost tray is below a sheet entry location and an upper position at which the sheet inlet ends of the trays except the lowermost tray are above the

sheet entry location for receiving sheets supplied from the sheet outlet of the host machine, and means freely and separa-



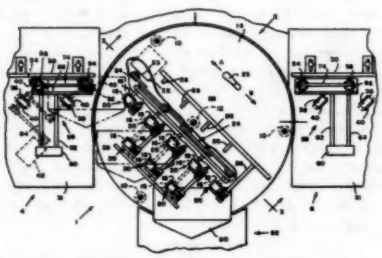
bly supporting the sheet inlet ends of said trays one on the other for vertical separation to enable sheet removal.

5,180,159

ADJUSTABLE RIGHT ANGLE TRANSFER DEVICE FOR CONVEYING FLAT ARTICLES IN ONE OF TWO DIRECTIONS

Shahzad H. Malick, Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 15, 1991, Ser. No. 792,563
Int. Cl.[5] B65H *39/10*
U.S. Cl. 271—302 **11 Claims**



1. An apparatus for changing the direction of travel of a flat article being conveyed in a first direction to one of two other directions without changing the orientation of the article, comprising:

a circular deck mounted on a frame, said deck being pivotable along a center axis of said deck between a left position and a right position;

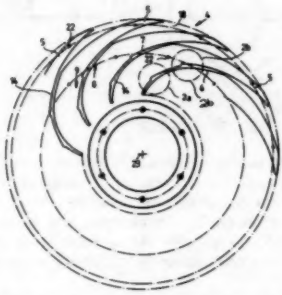
means operatively coupled to said deck for conveying the article over said deck, said deck conveying means having a first end and a second end, wherein, when said deck is in said left position, said deck conveying means receives the article being conveyed in the first direction at said first end and conveys the article in a second direction of forty-five degrees (45°) to the left of said first direction, and wherein, when said deck is in said right position, said deck conveying means receives the article being conveyed in the first direction at said second end and conveys the article in a third direction of forty-five degrees (45°) to the right of said first direction.

5,180,160

DELIVERY DEVICE IN THE FOLDING APPARATUS OF A ROTARY PRINTING PRESS

Roger R. Belanger, Dover; Richard B. Mack, Durham, and Michael A. Novick, New Durham, all of N.H., assignors to Heidelberg Harris GmbH, Heidelberg, Fed. Rep. of Germany

Filed Aug. 12, 1991, Ser. No. 743,994
Int. Cl.[5] B65H *29/20*
U.S. Cl. 271—315 **12 Claims**



1. A delivery device in a folding apparatus of a printing press, comprising:

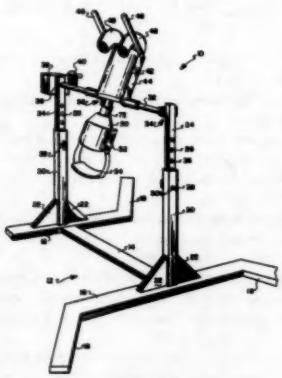
at least one fan wheel, said fan wheel, said fan wheel being formed of individual fan blades having respective edges defining fan wheel pockets between respective leading and trailing fan blades for receiving incoming folded products, the respective edge of each of said trailing fan blades partly defining each of said pockets being a leading edge relative to the incoming folded product and being formed with a first profile having at least one folded-product slow-down path, and the respective edge of each of said leading fan blades partly defining each of said pockets being a trailing edge relative to the incoming folded product and being formed with a second profile having a plurality of slow-down paths different from said one slow-down path of said first profile.

5,180,161

EXERCISE MACHINE

Brett M. Jordan, 1453 Algona Dr., North Canton, Ohio 44720

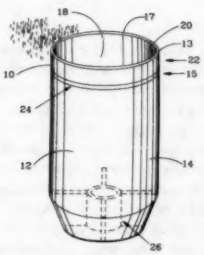
Filed Oct. 10, 1989, Ser. No. 419,108
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—143 **15 Claims**



1. An exercise machine, comprising:

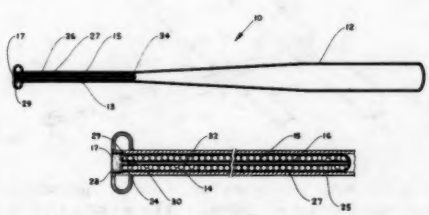
a pair of vertical support posts;
a rod horizontally extended between said support posts;
and upper back support plate connected to said rod; a lower back support plate adjustably connected to said upper back support plate; and
telescopic connection means for interconnecting said upper and lower back support plates in selective spaced apart relationship, said connection means comprising a universal connector, allowing said lower back support plate to swivel with respect to said upper back support plate.

5,180,162
GOLF HOLE COLLAR
Richard P. Browne, 26 Lazy La., The Woodlands, Tex. 77380
Filed Sep. 26, 1991, Ser. No. 766,056
Int. Cl.[5] A63B *57/00*
U.S. Cl. 273—34 R **5 Claims**



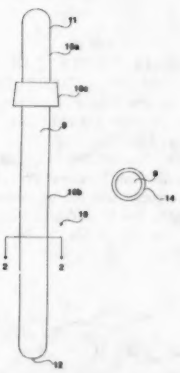
1. A device for increasing the visibility of a golf putting hole in a natural grass putting green and adapted to be installed against the earth extending between the upper lip of the hole and the upper edge of the recessed liner in said hole, comprising a brightly colored, cylindrical collar having upper and lower perimeters, a height slightly less than the distance between said lip and said upper edge of the hole liner, and an inside diameter essentially the same as a regulation golf hole diameter, the properties of said collar being such as to impart an absence of elastic reaction to an impinging golf ball and sufficiently stiff to retain the regulation diameter and sufficiently flexible to permit the temporary collapse of its diameter, and said collar having tab members extending upwardly around said upper perimeter.

5,180,163
BASEBALL BAT
Paul A. Lanctot, 520 Sand Hill Rd., and Donald E. Collett, 6001 Butler La., both of Scotts Valley, Calif. 95066
Continuation-in-part of Ser. No. 689,010, Apr. 22, 1991, abandoned. This application Dec. 27, 1991, Ser. No. 815,556
Int. Cl.[5] A63B *59/06*
U.S. Cl. 273—72 R **19 Claims**



1. A ball bat comprising:
an elongated body with a free end portion of one diameter tapering to a handle portion of a reduced diameter,
a tubular member inserted into said handle portion of said ball bat, the tubular member having a first open end and a second end, said tubular member extending within said handle portion of said elongated body,
an elongated spine member secured within said tubular member, a plurality of particles interiorly disposed between said tubular member and the elongated spine member in the handle portion of the tube;
a fluid interiorly situated within said tubular member, and means for sealing said opening in said first end of said tubular member.

5,180,164
TOHITI RATTAN POLICE BATON
Richard J. Celaya, 5 Cape Ct., Monsey, N.Y. 10952
Filed Oct. 28, 1991, Ser. No. 783,610
Int. Cl.[5] F41B *15/02*
U.S. Cl. 273—84 R **20 Claims**

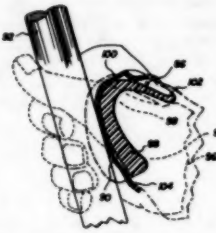


1. A law enforcement baton having high flexural strength and light weight made from tohiti rattan having a core and an outer skin, comprising:
an elongated member comprising a base of rattan material and comprising essentially only the core of tohiti rattan having a composite coating thereon, and having an approximate length ranging between eighteen and thirty-six inches, a diameter in a range of approximately 0.9 to 1.2 inches, and having an approximate weight in a range from 8 to 11 ounces.

5,180,165
HAND ACCESSORY
John H. Frost, 781 S. Kohler St., Los Angeles, Calif. 90021
Continuation-in-part of Ser. No. 611,616, Nov. 13, 1990, Pat. No. 5,069,454. This application Oct. 28, 1991, Ser. No. 783,176
The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.
Int. Cl.[5] A63B *57/00*
U.S. Cl. 273—165 **5 Claims**

1. A hand accessory to be used in conjunction with the handle of an implement, said accessory comprising a solid plug contoured to fit into the web portion of the hand between the ball of the thumb and the base of the forefinger and to extend down into the palm of the hand, said plug having a front surface which is concavely curved to fit the contour of the handle of the implement when held in the hand, said plug having a convexly curved back surface which is to impress into the web portion and into the palm of the hand, said plug being adapted

to transmit full power directly between the hand and handle without substantial relative movement of the web; and



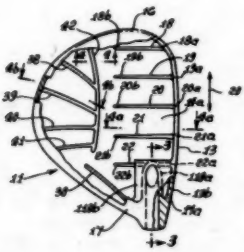
said concave front surface extends in substantially a straight line forming a side of a right triangle at an outer end which is located nearest the thumb of the user.

5,180,166

HOLLOW, METALLIC GOLF CLUB HEAD WITH DENDRITIC STRUCTURE

Glenn H. Schmidt, Malibu; John P. Sheehan, Covina, and Richard C. Helmstetter, Carlsbad, all of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

Continuation of Ser. No. 595,963, Oct. 16, 1990, Pat. No. 5,067,715. This application Nov. 14, 1991, Ser. No. 791,322
The portion of the term of this patent subsequent to Nov. 26, 2008, has been disclaimed.
Int. Cl.[5] A63B *53/08*
U.S. Cl. 273—167 F **23 Claims**



1. In a metal wood golf club head having an elongated, forwardly facing front wall to strike a golf ball, and a hollow body rearwardly of the face plate that includes a curved rear wall, the front wall elongated in a first transverse direction toward a connection to a club shaft, the body having a thin, metallic top wall merging with upper transverse extent of the front wall, the combination comprising:

a) a first group of narrow, metallic, shock wave distributing dendrites extending from said front wall generally rearwardly adjacent the underside of the body top wall and integral therewith,

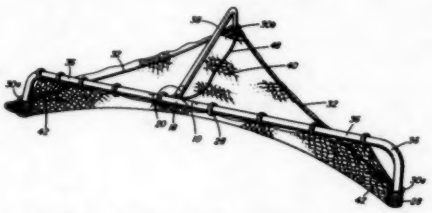
b) there being a second group of dendrites integral with said top wall and which are spaced apart in said transverse direction, and which extend generally rearwardly to merge rearwardly and downwardly with said curved rear wall to transfer rearward loading to that wall as the dendrites pick up rearward loading from said top wall in response to front wall impact with a golf ball, said second group dendrites being upwardly arched along their rearwardly extending lengths and projecting into said hollow body along their lengths to terminate in said hollow body in a separated relation to said front wall.

5,180,167

GOLF SWING PRACTICE NET

Clifford J. Felix, 6220 Twin Tree Place, Richmond, British Columbia, Canada V7C 4A4

Filed Jan. 21, 1992, Ser. No. 823,325
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—181 F **33 Claims**



1. A golf swing practice device comprising:

a) a frame comprising first and second frame elements, said first frame element comprising a first generally horizontally extending member and first and second leg members extending downwardly at opposed ends of said first horizontal member, and said second frame element comprising a second generally horizontally extending member having first and second ends, pivotally connected at said first end thereof to said first horizontal member for rotation about a vertical axis at a point located centrally on said first horizontal member between said opposed ends thereof, and a third leg member extending downwardly from the second end of said second horizontal member;

b) a net having a mesh adapted to prevent passage of a golf ball; and

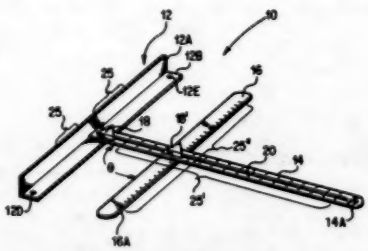
c) flexible means extending between said second end of said second horizontal member and each of said opposed ends of said first horizontal member for suspending said net from said frame, the length of said flexible means between said second end of said second horizontal member and either of said opposed ends being adjustable.

5,180,168

PUTTING PRACTICE DEVICE

Harry Balestrieri, 12451 N.W. 3rd St. B4, Plantation, Fla. 33325

Filed Feb. 19, 1992, Ser. No. 836,753
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—187 R **16 Claims**



1. A collapsible putting practice device for eliminating lateral motion from a putting stroke and for assisting a golfer in maintaining a consistent stance and putting stroke, said putting practice device comprising:

an elongated L-shaped angle bar having a vertical portion and a base portion, wherein the outside, surface of said

vertical portion defines a bearing surface for the heel of a putter;

an elongated foot member;

an elongated central member having a longitudinally disposed slot extending down the middle of said central member;

a first hand-adjustable tightening means for pivotally attaching said angle bar to said central member;

a second hand-adjustable tightening means for attaching said foot member to said central member at a selectively chosen position along the length of said central member and in a selectively chosen angular orientation with respect to said central member.

5,180,169

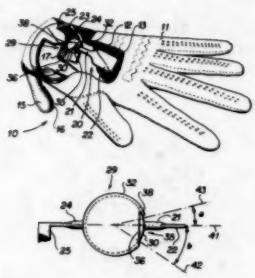
GOLF SWING AID

Jung-Soo Choy, 4104-A Dunwoody Park, Dunwoody, Ga. 30338

Filed Apr. 29, 1992, Ser. No. 875,402

Int. Cl.[5] A63B *69/36*

U.S. Cl. 273—189 A **10 Claims**



1. A golf swing aid for use in controlling the flexing of a golfer's wrist during play comprising a hand support member, mounting means for mounting said hand support member to the back of a golfer's hand, a forearm support member, mounting means for mounting said forearm support member to the golfer's forearm, and a ball and socket joint coupling said hand support member with said forearm support member to permit articulated movement of said hand support member with respect to said forearm support member, said ball and socket joint being configured to allow substantially greater forward articulated movement of said hand support member with respect to said arm support member than backward articulated movement of said hand support member with respect to said arm support member.

5,180,170

MICROSWITCH ACTIVATING DEVICE FOR FISHING GAME APPARATUS

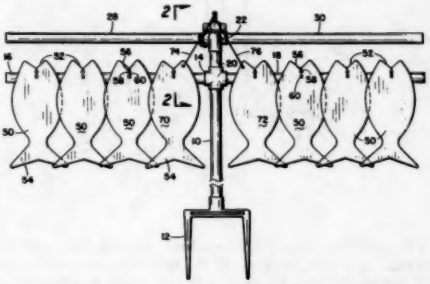
Arlen J. Lowrance, 2121 S. Yorktown #802, Tulsa, Okla. 74114

Continuation-in-part of Ser. No. 667,178, Mar. 11, 1991, Pat. No. 5,094,461. This application Aug. 15, 1991, Ser. No. 745,545

Int. Cl.[5] A63F *9/00*

U.S. Cl. 273—343 **2 Claims**

1. In a fishing game apparatus of the type having a horizontal support, a plurality of flat, relatively thin, fish-shaped members each having the outline of a fish and each being releasably attached to the horizontal support, wherein a timing mechanism is associated with the apparatus, wherein the removal of a first preselected fish-shaped member will initiate the actuation of the timing mechanism and wherein the removal of a second preselected fish-shaped member will terminate the operation of the timing mechanism, wherein the timing mechanism is actuated by a microswitch having a momentary toggle arm, the improvement which comprises an actuating rod having an upper end and a lower end, the lower end of the actuating rod having a bore adapted to snugly receive the toggle arm of the microswitch, the upper end of the actuating rod being provided with a vertical notch, each preselected fish-shaped member being provided with a string which connects at one end to the preselected fish-shaped member and which has another knotted end adapted to be received in the notch of the actuating rod whereby removal of the first preselected fish-shaped member from the horizontal support will cause the string of the first preselected fish-shaped member to pivot the actuating rod to actuate the timer, after which the knot on the end of the string will slide out of the notch to release the first



preselected fish-shape member from the fishing game apparatus and initiate the operation of the timer and whereby removal of the second preselected fish-shaped member from the horizontal support will cause its associated string to pivot the actuating rod a second time, followed by the sliding of the knot on the associated string of the second preselected fish-shaped member out of the notch to release the second preselected fish-shaped member from the fishing game apparatus and to actuate the microswitch to stop the timer.

5,180,171

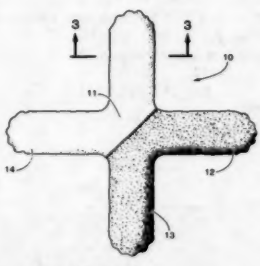
GAME PROJECTILE

Patricia S. Panzica, and Guy I. Goodrell, both of 37 Macon Dr., Henrietta, N.Y. 14623

Filed Jul. 7, 1992, Ser. No. 909,793

Int. Cl.[5] A63B *65/00*

U.S. Cl. 273—428 **2 Claims**



1. A game projectile including:

a central hub and four gripping arms extending radially therefrom at 90° angles in a crossed configuration and in a common plane;

said hub and said arms including a cover enclosing a body of filler material, said cover and said filler material together forming a firm cushion;

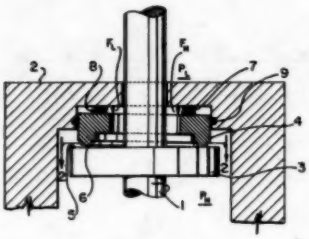
said arms being generally cylindrical, approximately seven inches in length from the center of said hub and approximately two inches in thickness to facilitate gripping, throwing, and catching thereof.

5,180,172

ECCENTRIC FACE SEAL WITH ASYMMETRIC CLOSING FORCE

Raymond Metcalfe, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Aug. 15, 1991, Ser. No. 745,409
Claims priority, application Canada, Aug. 16, 1990, 2023456
Int. Cl.[5] F16J *15/34*
U.S. Cl. 277—27 **5 Claims**



1. In a face seal for a rotary machine having a rotor sealingly mounted to a rotatable shaft of the machine and a stator sealingly connected to a housing of the machine, and having opposing substantially planar seal faces, one of which has an annular shape and which is eccentric with respect to the longitudinal axis of the shaft, said seal faces forming a partition between a region of relatively high pressure and a region of relatively low pressure; the improvement comprising;

one of the rotor and stator including a movable element mounted for motion along the longitudinal axis of the shaft, and tiltable about the longitudinal axis, and sealingly secured to the shaft or housing, respectively;

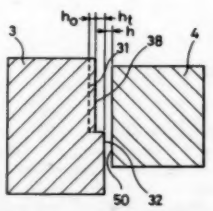
means for applying an asymmetric closing force on the movable element towards the seal faces such that a higher closing force is applied to a first portion of the seal face where a first tangential velocity vector of the rotor is directed from a region of higher to lower fluid pressure, than to an opposite, second portion of the seal face where a second tangential velocity vector of the rotor is directed from a region of lower to higher fluid pressure.

5,180,173

SPIRAL GROOVE FACE SEAL

Yoshikazu Kimura, Fujisawa, and Hideo Teuboi, Tokyo, both of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Jul. 9, 1991, Ser. No. 727,272
Claims priority, application Japan, Jul. 9, 1990, 2-72261[U]; Jun. 21, 1991, 3-177524
Int. Cl.[5] F16J *15/34*
U.S. Cl. 277—96.1 **22 Claims**



1. In a spiral groove face seal having a stationary sealing ring and a rotating sealing ring with opposed radially extending sealing surfaces, said rotating sealing ring being in contact with said stationary sealing ring at at least a part of said sealing surfaces when said rotating ring is stopped, said rotating sealing ring being brought out of contact with said stationary sealing ring when said rotating sealing ring is rotated, the improvement comprising:

spiral grooves formed in a spiral groove area of one of said sealing surfaces and extending from one circumference of said one of said sealing surfaces in a radial direction; and

a recess formed in one of said sealing surfaces, said recess being located in said spiral groove area and extending beyond said spiral groove area to a flat surface of an ungrooved area.

2. The spiral groove face seal according to claim **1**, wherein said recess is formed on said sealing surface of said rotating sealing ring.

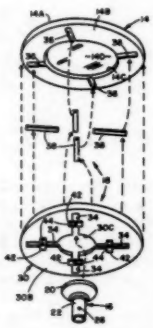
8. The spiral groove face seal according to claim **2**, wherein said recess has a depth of not more than 3 μm.

5,180,174

POTTER'S WHEELHEAD ASSEMBLY WITH RELOCATABLE AXIS OF ROTATION

Clarence T. Province, 5978 Hill St., Berrien Springs, Mich. 49103

Filed Jun. 27, 1991, Ser. No. 722,006
Int. Cl.[5] B28B *17/00*; B23B *31/36*
U.S. Cl. 279—6 **11 Claims**



1. A wheelhead assembly for use upon a vertical rotary drive shaft of a potter's wheel, said wheelhead assembly comprising:

(a) means defining an upper surface for mounting a mass of clay to be molded into an article of pottery;

(b) a drive shaft coupler having a fixed axis of rotation and supporting said upper surface defining means upon the rotary drive shaft of the potter's wheel for rotation with said coupler about said axis of rotation; and

(c) means for releasably securing said upper surface defining means to said drive shaft coupler and for adjustably relocating said upper surface defining means relative to said drive shaft coupler to a selected one of a multitude of different positions along orthogonal X-Y coordinates defined by said securing and relocating means to thereby relocate said axis of rotation of said upper surface defining means relative to said drive shaft coupler to said selected one position along said orthogonal X-Y coordinates;

(d) said drive shaft coupler including an upper mounting base supporting said upper surface defining means and a hollow coupling sleeve attached to said base and extending downwardly therefrom and capable of insertion over and releasable attachment to an upper end of the drive shaft of the potter's wheel;

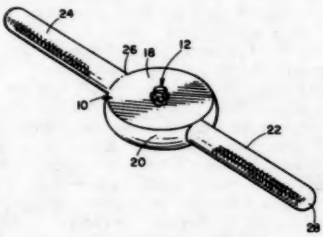
(e) said upper surface defining means being a top plate and having a lower surface with a centrally-located circular bottom cavity recessed therein, said mounting base of said drive shaft coupler being disposed in said cavity.

5,180,175

DRILL CHUCK KEY

Mike Doolittle, 10 St. Paul St. Apt. 1, Grayslake, Ill. 60030

Filed Feb. 22, 1991, Ser. No. 659,221
Int. Cl.[5] B25B *13/44, 13/46*
U.S. Cl. 279—147 3 Claims



1. A chuck key for tightening and loosening a drill chuck comprising:

A) a central hollow, cylindrical body having a top surface, a bottom surface and a peripheral wall connecting said top surface to said bottom surface, said central body having a center and a diameter extending through said center;

B) two handles, each connected at a proximal end thereof to said central body peripheral wall and having a distal end spaced from said peripheral wall, said handles being axially aligned with each other and with said central body diameter; and

C) a drill chuck operating mechanism including

(1) a reversing mechanism housed within said hollow circular body and including

(a) a first gear connected to said central body for movement therewith,

(b) a second gear mounted in said central body, and

(c) means for engaging said first gear with said second gear to drive said second gear in conjunction with said first gear,

(2) a selection switch connected to one of said first and said second gears, and

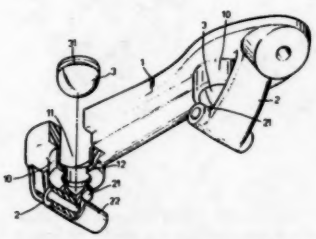
(3) a bevel gear attached to at least one of said first and second gears for movement therewith and located at said central body center.

5,180,176

ELASTIC TRUCK FOR ROLLER SKATES

Ting-Hsing Chen, Tainan, Taiwan, assignor to Far Great Plastics Industrial Co., Ltd., Taiwan

Filed Aug. 8, 1991, Ser. No. 742,242
Int. Cl.[5] A63C *17/02*
U.S. Cl. 280—11.28 2 Claims



1. An elastic truck for a roller skate comprising:

a baseplate;

curved front and curved rear beams, with an upper portion of each beam being integrally formed to an underside of said baseplate, with said front beam located at a front portion of said baseplate and said rear beam being located at a rear portion of said baseplate;

two brackets, each of which has a bowl-shaped recess, respectively formed on lower portions of said beams, with said recesses facing upward;

cylindrical front and rear bosses, with an upper portion of each boss being integrally formed to said underside of said baseplate, with each boss having an inner bore generally perpendicular to said underside of said baseplate, with said front boss being located directly above the bracket of said front beam and said rear boss being located directly above the bracket of said rear beam; and

two generally semispherical elastic elements respectively mounted to said front and rear bosses, each elastic element having a lower spherical portion disposed outwardly of said bosses and seated into the corresponding recesses of said brackets and each elastic element also having an upper portion secured to a respective boss, each upper portion having a top surface with an open blind cavity extending therein;

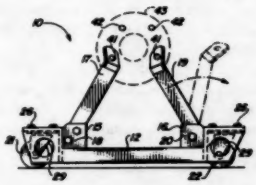
wherein said blind cavities permits said elastic elements to flex and deform in correspondence with the magnitude and direction of an applied force.

5,180,177

ADJUSTABLE WHEEL SUPPORT DEVICE

Donald F. Maki, P.O. Box 25707, Tempe, Ariz. 85285, assignor to Deborah Carla Macha and Donald F. Maki, Tempe, Ariz.

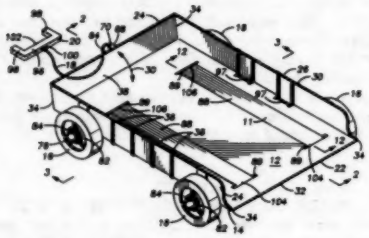
Filed Jun. 19, 1991, Ser. No. 717,673
Int. Cl.[5] B62B *3/02*
U.S. Cl. 280—47.15 7 Claims



1. A wheel support device for attachment to a vehicle wheel hub by lug bolts associated therewith, said device comprising: a generally rectangular base member having an upper and a lower surface, each of said surfaces having a proximal, and distal end, a first edge and a second edge; a first pivotal center mounted to said lower surface of said base member adjacent said distal end; a second pivotal caster mounted to said lower surface of said base member adjacent said proximal end, the axis of rotation of each said casters intersecting the plane of said upper surface at a point, said points defining a longitudinal axis therebetween which is generally parallel to said first edge and said second edge and intermediate thereof; a first bracket mounted on said base member adjacent said distal end intermediate said first and said second casters; a second bracket mounted on said upper surface of said base member adjacent said proximal end intermediate said first and said second casters in spaced relationship to said first bracket; a first arm member rigidly attached to said first bracket and having an inner and an outer face surface defined thereon in spaced generally parallel relationship to each other, said inner surface being disposed in coplanar relationship to said longitudinal axis, said first arm member having an aperture defined therethrough between said surfaces for receiving a first wheel lug bolt in detachable secured relationship therewithin; a second arm member pivotally attached to said second bracket and having an inner and an outer face surface defined thereon in spaced generally parallel relationship to each other, said inner surface being disposed in coplanar relationship to said longitudinal axis, said second arm member having an aperture defined therethrough between said surfaces for receiving a second

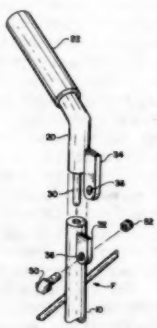
wheel lug bolt in detachable secured relationship therewithin, each said inner face surface of each said arm member being adapted to engage said wheel hub in surface-to surface engagement therewith when said lub bolts extend into and through said apertures, said surface-to-surface engagement lying in coplanar relationship with said longitudinal axis.

5,180,178
RECREATIONAL CART
Roberto Caceres, 730 W. 6th, Freeport, Tex. 77541
Filed Dec. 28, 1989, Ser. No. 458,297
Int. Cl.[5] B62B *3/00*
U.S. Cl. 280—47.34 **10 Claims**



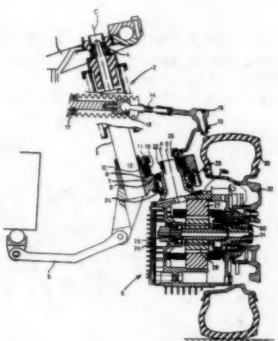
1. A cart, comprising;
a one piece body portion and undercarriage;
at least one stationary axle portion disposed within said one piece body portion and undercarriage and having at least one axle end portion projecting outward from said body portion; said axle portion including at least one slot therethrough, and a portion of said body and undercarriage are received therein;
a wheel attached to each of said axle end portions;
said body portion and undercarriage being molded over said stationary axle portion to secure said stationary axle portion in place within said unitary body and undercarriage portion.

5,180,179
GAS CYLINDER CART REMOVABLE HANDLE
Frank S. Salvucci, 1401 E. Palm, El Segundo, Calif. 90245
Filed Feb. 1, 1991, Ser. No. 649,497
Int. Cl.[5] B62B *1/04*
U.S. Cl. 280—47.315 **5 Claims**



1. In a cart means having a frame and means for securely holding an object, and including at least one tubular generally upright member having a cylindrical inner bore, the improvement comprising:
a frame part of said member permanently affixed to said frame, said frame part having a frame part end;
a handle part of said member having a handle part end abutting said frame part end;
a cylindrical dowel disposed within said bore of said member and extending from said handle part into said frame part, said dowel closely fitting within said bore; and
disengagable attachment means for holding said handle part against translational and rotational motion relative to said frame part; whereby
said handle part may be removed from said frame part for storage and wherein said attachment means includes:
a generally planar frame bracket attached to an exterior surface of said frame part adjacent said frame part end, said frame bracket disposed in a generally radial extension from a center line of said bore of said frame part, said frame bracket including a first hole therethrough; and
a generally planar handle bracket attached to an exterior surface of said handle part adjacent said handle part end, said handle bracket disposed in a generally radial extension from a center line of said bore of said handle part, said handle bracket including a second hole therethrough; and wherein
said frame bracket, said first hole, said handle bracket, and said second hole are so disposed that frame bracket and said handle bracket may be made flush, and said first hole and said second hole may be coaxially aligned and adjacent one to another for passage of a bolt simultaneously through both said first hole and said second hole when said handle part is rotationally oriented to said frame part; whereby
said bolt may be passed through said first and second holes and a nut tightened thereupon for pressing said frame bracket and said handle bracket together to prevent said frame part from separating from said handle part.

5,180,180
WHEEL SUPPORTING APPARATUS
Mitugu Yamashita; Mutsumi Kawamoto, both of Tokyo, and Hidemitsu Inagaki, Nishio, all of Japan, assignors to Aisin AW Co., Ltd., Japan
Filed Apr. 24, 1991, Ser. No. 690,835
Int. Cl.[5] B60G *3/00*
U.S. Cl. 280—96 **6 Claims**



1. An electric wheel motor and supporting apparatus for rotatably supporting the electric wheel motor on a vehicle frame, comprising:
a wheel motor including:
a motor casing having an upper extension fixed thereto;
a stator element fixed to said motor casing; and
a rotor rotatably mounted within said motor casing;

a wheel rotatably mounted on said motor casing; and

output means for transmitting power from said wheel motor to said wheel, for rotatably driving said wheel;

a strut type suspension including:

a strut having an upper end supported by the vehicle frame, a lower end and a longitudinal axis extending between said upper and lower ends; and

an arm member pivotally connecting said lower end of said strut to the vehicle frame;

wheel motor support means, mounted on said lower end of said strut and rotatably connected to said upper extension, for rotatably suspending said wheel motor from said upper extension for rotation around a steering axis.

5,180,181

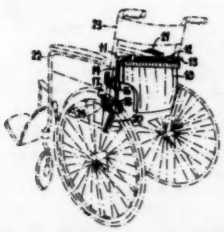
MOTORIZED MOVABLE STORAGE BAG FOR USE ON A WHEELCHAIR

Jorge Letechipia, Allentown, Pa., assignor to The Good Shepherd Rehabilitation Hospital, Allentown, Pa.

Filed Oct. 28, 1991, Ser. No. 783,366

Int. Cl.[5] B62K *15/00*

U.S. Cl. 280—304.1 **26 Claims**



1. A movable storage device for use on a personal transportation device for a handicapped person having at least one rear wheel, a side, a wheelchair seat having a bottom and a backrest, and at least one frame member for the seat, comprising:

storage means for receiving articles;

a support bar having a bag section and a pivot section, said bag section supporting said storage means;

hinge means fixedly attachable to the at least one frame member of the personal transportation device, said pivot section of said support bar rotatively cooperating with said hinge means, for rotation of said storage means from a position disposed behind the backrest to alongside the personal transportation device; and,

drive means for rotating the pivot section and the bag section of the movable support in at least one direction for moving the bag section between the position behind the personal transportation device and the position alongside the personal transportation device.

5,180,182

TRAILER HITCH ALIGNMENT DEVICE

James R. Haworth, 7818 East Bay Dr., North Bend, Oreg. 97459

Filed Aug. 26, 1991, Ser. No. 749,985

Int. Cl.[5] B60D *1/36*; G02B *5/08*

U.S. Cl. 280—477 **10 Claims**

1. A trailer hitch alignment device, comprising:

a. a base member, having a first side edge and an opposing second side edge;

b. a mirror surface formed on said base member;

c. a first side member, having a hinge edge;

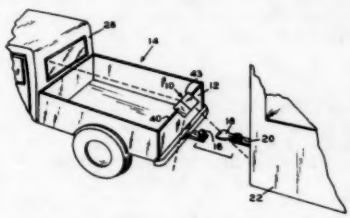
d. means for pivotally attaching the hinge edge of said first side member to said first edge of said base member to permit rotational movement of said first side member between a closed position proximate said mirror surface and an open position at an angle from said base member;

e. said first side member having a slot formed in an edge opposing said hinge edge of said first side member;

f. a second side member, having a hinge edge;

g. means for pivotally attaching the hinge edge of said second side member to said second edge of said base member to permit rotational movement of said second side member between a closed position adjacent to said first side member in a closed position and an open position at an angle from said base member;

h. said second side member having a slot formed in an edge opposing said hinge edge of said second side member, said



slot being substantially a reflection of said slot formed in said first side member;

i. said slots formed in said first and second side members being aligned, in the open position, to permit ready engagement of a vehicular tailgate member along a top edge thereof, and being disposed at an angle relative to said hinge edge so as to support the trailer hitch alignment device in a top-forward position oriented to permit a driver to observe, by means of said mirror surface, the relative alignment of a hitch ball to a coupling of a towed vehicle.

5,180,183

RELEASABLE SKI BINDING

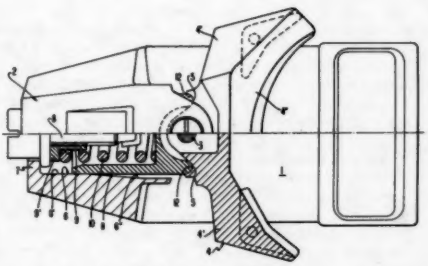
Martin Bogner, Ostfildern, Fed. Rep. of Germany, assignor to GEZE Sport International GmbH, Fed. Rep. of Germany

Filed Jan. 17, 1991, Ser. No. 642,423

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1990, 4001950

Int. Cl.[5] A63C *9/08*

U.S. Cl. 280—629 **23 Claims**



1. A releasable ski binding comprising:

a boot holder part clampingly engageable with a ski boot or ski boot sole holder,

a vertical pivot mount for mounting the boot holder part at a ski and for permitting swivelling movement of the boot holder part about a vertical pivot axis between a normal skiing position clampingly holding the ski boot and a release position permitting release of the ski boot,

a piston abuttingly engageable with the boot holder part to resist movement of the boot holder part from the normal

skiing position while permitting such movement in response to a predetermined force from the boot holder part during swivelling movement thereof,

and a guide surface arrangement for guiding movement of the piston during swivelling movement of the boot holder part, said guide surface arrangement including a first guide section with interengageable sliding surfaces for guiding the piston substantially without play in the transverse direction of the ski only in an area of the piston disposed away from its end area engageable with the boot holder part and a second guide section adjacent said end area which permits slight transverse movement of an area of the piston adjacent said end area during longitudinal movement of the piston when the boot holder part is swivelled toward its release position.

5,180,184

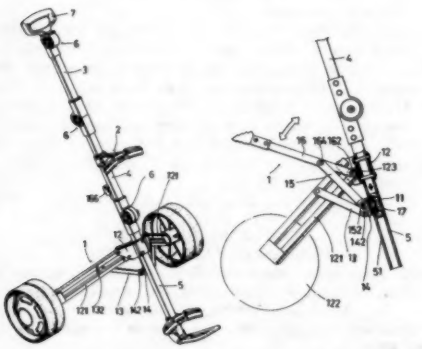
COLLAPSIBLE THREE-STAGE GOLF CART

Hsiu-Hui Chiu, Tainan Hsien, Taiwan, assignor to Sunshon Molding Co., Ltd., Tainan Hsien, Taiwan

Filed Jan. 31, 1992, Ser. No. 828,495

Int. Cl.[5] B62B *1/04*

U.S. Cl. 280—646 **2 Claims**



1. A collapsible three-stage golf cart comprising:

an upper frame having a grip handle formed on an upper end thereof, said upper frame being coupled to an intermediate frame at a lower end of said upper frame through a joint member coupling, said intermediate frame being displaceably coupled to said upper frame at an upper end of said intermediate frame with said intermediate frame being displaceably coupled to a lower frame through a joint member coupling, said lower frame formed of a hollow rod of substantially rectangular cross-section defining a longitudinally directed rectangular cavity passing therethrough to receive a slide block for slidable engagement therein and further including an elongate opening formed within one side of said lower frame for a connecting plate to be displaceably positioned therein;

at least one collapsible wheel mechanism including an operating rod having a lower end pivotally connected to a positioning plate which is fixedly secured to a wheel rod base and an upper portion of said lower frame, an upper portion of said operating rod being connected to an actuating member;

a pair of wheel rods having a pair of respective inner ends pivotally coupled to said wheel rod base and a pair of respective outer ends coupled to a wheel member for rotational interface with a base surface, one of said wheel rods having a central portion pivotally connected to a first end of a folding rod, said folding rod having a second end pivotally connected to a position member of a slide base slidably mounted on said lower frame;

a connecting rod having one end pivotally connected to a central portion of said operating rod and an opposite end pivotally connected to a projecting portion of said slide base, said slide base further defining a rear vertical wall formed with two holes to receive a pair of screws to connect said slide base to said connecting plate and said slide block, said slide block having a rectangular contour and being slidingly engaged in the hollow longitudinal cavity of said lower frame, said slide block having a contoured recess formed in one side thereof and a pair of threaded holes located within the contour of said recess to receive a pair of threaded members to connect the slide block with said connecting plate and said slide base;

a wheel rod base consisting of two inverted U-shaped plates bolted on the upper portion of the lower frame having said positioning plate firmly fixed at a central portion thereof and pivotally coupled to said operating rod and,

said operating rod being manually displaceable to a position adjacent the intermediate frame resulting in the collapsible wheel mechanism to be extended for positional use of said golf cart and to a position adjacent the lower frame such that said operating rod, said connecting rod, said wheel rods, and said folding rod are displaced to a position contiguous to the the lower frame for minimizing the volume dimension of said golf cart for ease in transportation and storage.

5,180,185

DEVICE FOR OBTAINING AN AXLE-LOAD SIGNAL OF A MECHANICALLY SPRING-SUPPORTED DRIVE AXLE OF A LIFTING AXLE STRUCTURE

Horst Eckert, Rehburh-Loccum, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

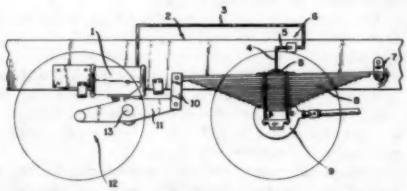
Continuation of Ser. No. 540,649, Jun. 19, 1990, abandoned.

This application Sep. 12, 1991, Ser. No. 758,111

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1989, 3920287

Int. Cl.[5] B60G *17/00, 17/02, 25/00*

U.S. Cl. 280—704 **11 Claims**



1. An apparatus for obtaining an axle-load signal from a mechanically spring-supported drive axle of a lifting axle structure aggregate comprising said drive axle and a lifting axle supported by at least one pressure-means element, said lifting axle being disengageable by application of a pressure of at least a level of a disengagement pressure to said at least one pressure-means element, comprising

(a) a signal body which is rotatable, depending on the path of a first point of the drive axle relative to a vehicle chassis, around a rotation axis fixedly disposed at the vehicle chassis;

(b) a jacket face of the signal body exhibits at least one contour which assumes for each rotation position of the signal body a predetermined distance, disposed substantially perpendicular to the rotation axis relative to a second point of the vehicle chassis;

(c) wherein the apparatus includes an electrical distance path sensor comprising a stator for capturing the predetermined distance,

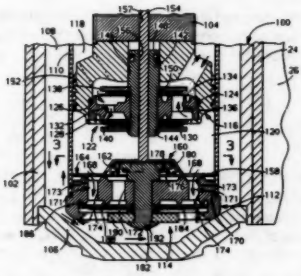
wherein the stator of the distance path sensor is axially movable relative to said second point of the vehicle chassis depending on the pressure of the pressure means element.

5,180,186

STRUT AND METHOD FOR STEER-SENSITIVE DAMPING

Harlan W. Charles, Detroit, and Larry D. Miller, Rochester Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1991, Ser. No. 790,993
Int. Cl.[5] B60G *11/26*
U.S. Cl. 280—714 **30 Claims**



1. A hydraulic damper for controlling the compression and rebound action of a vehicular suspension spring, the damper comprising:

(a) a reservoir rube connected to a steerable wheel assembly;

(b) an inner cylinder fixedly mounted within the reservoir tube and cooperating therewith to form a reservoir for a damper fluid contained within the reservoir tube and the inner cylinder;

(c) base valve means operatively mounted at one end of the inner cylinder for controlling the flow between the inner cylinder and the reservoir tube;

(d) a piston rod operatively mounted for reciprocating movement in the inner cylinder and extending through an upper end of the damper;

(e) a piston secured to an inner end of the piston rod and dividing the interior of the inner cylinder into upper and lower chambers, the piston slidably mounted in the inner cylinder for both reciprocable and rotary motion with respect to the inner cylinder;

(f) piston valving means in the piston establishing a restricted flow path through the piston between the upper and lower chambers during compression and rebound of the damper; and

(g) control valving means establishing a variable flow between the lower chamber and the base valve means, the control valving means actuated by the relative rotation between the reservoir tube and the piston provided by a steering motion of a vehicle.

5,180,187

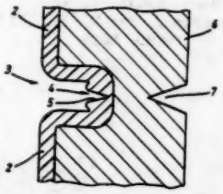
COVER FOR AN AIRBAG UNIT AND THE PROCESS FOR PRODUCING IT

Manfred Müller, Deizisau; Wolfgang Henseler, Tübingen; Egon Katz, Nagold; Alban Bossenmaier, Gäufelden, and Dietrich Hamm, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Continuation of Ser. No. 470,798, Jan. 26, 1990, abandoned. This application Jul. 18, 1991, Ser. No. 731,974
Int. Cl.[5] B60R *21/08*
U.S. Cl. 280—732 **9 Claims**

1. A cover for an airbag unit having a tear line, comprising:

a foil layer, having an outer surface, an inner surface, and a foil wall thickness, including a substantially U-shaped channel formed in said foil layer by heating and deep drawing said foil layer in the region of the tear line, said U-shaped channel having an open end on said outer surface and a bottom channel surface, said foil wall thickness being reduced at said bottom channel surface by high frequency embossing to form an inconspicuous tear line; and



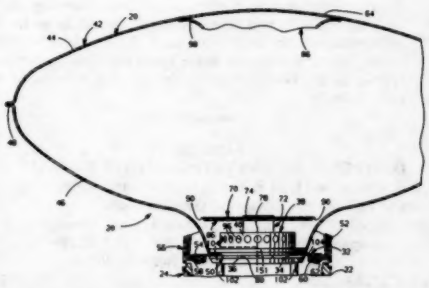
a foam layer adhered to said inner surface of said foil layer by foam backing said foil layer in a mold.

5,180,188

INFLATION GAS FLOW DIRECTING MEMBER FOR AIR BAG SYSTEM

Brian H. Frantz, Royal Oak; Jack L. Jensen, Highland, and Gregory A. Miller, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1991, Ser. No. 752,135
Int. Cl.[5] B60R *21/26*
U.S. Cl. 280—740 **6 Claims**



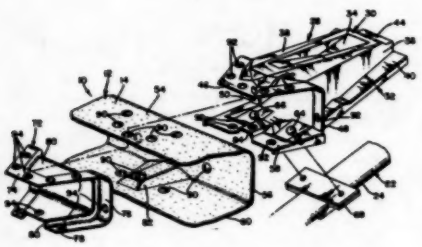
1. An occupant restraint system comprising, support means, an inflatable occupant restraint cushion mounted to the support means and including an upper wall portion spaced from the support means, a source of pressure fluid for inflating and deploying the cushion, a pressure fluid reaction member covering the inside of the upper wall portion of the cushion, means mounting the reaction member to the support means in overlying relationship to the source of pressure fluid, a sheet of flexible material having an inner portion covering the reaction member and an outer portion secured to the inside of the upper wall portion of the cushion, the sheet of flexible material pocketing the reaction member to the inside of the upper wall portion of the cushion to seal the interface between the reaction member and such upper wall portion during the initial stage of deployment of the cushion, and means associated with the reaction member severing the outer portion of the sheet of flexible material from the inner portion thereof during a subsequent stage of deployment of the cushion to permit such outer portion to move with the cushion toward the occupant.

5,180,189

VEHICLE STEERING COLUMN INSTALLATION

Ricardo H. Moreno, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 3, 1991, Ser. No. 752,354
Int. Cl.[5] B62D *1/16*
U.S. Cl. 280—779 **6 Claims**



1. A steering column bracket assembly for a steering column of a vehicle body, the steering column assembly bracket comprising:

a polymeric beam carried by the vehicle body having a first side and a second side and a plurality of holes between the sides and the beam having a groove;

a support bracket engaging the first side of the beam and having a protrusion for aligning and engaging with the groove of the beam and having a plurality of embossments for aligning with and being received by the holes in the beam;

mounting means for securing the steering column to the support bracket; and

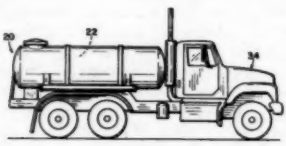
an insert bracket for engaging the second side of the beam and having a recess for aligning with and receiving the groove of the beam and having a plurality of embossments for aligning with and being received by the holes in the beam whereby the embossments of the brackets are connected through the holes in the beam securing the support bracket to the beam to secure the steering column to the vehicle body.

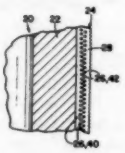
5,180,190

DAMAGE-RESISTANT CONTAINMENT DEVICE

Joe B. Kersey, and Gail F. Davis, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 531,980, Jun. 1, 1990, abandoned. This application Aug. 20, 1991, Ser. No. 750,718
Int. Cl.[5] B60F *3/22;* **B65D** *90/02*
U.S. Cl. 280—838 **18 Claims**





1. A damage-resistant containment device for containing and transporting a cargo, comprising:

a non-metallic container capable of independently containing and supporting the cargo, the container having an impact receiving surface; and

a damage-resistant coating, the coating comprising:

at least one high strength fiber selected from the group consisting of ultrahigh molecular weight polyethylene fiber and high strength aramid fiber; and

an elastomeric matrix for supporting the fiber and for bonding the fiber to the container,

wherein the elastomeric matrix bonds the coating to the container and

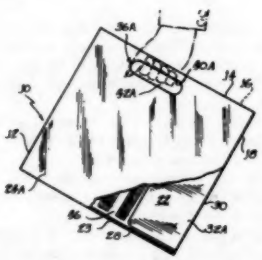
wherein the coating is bonded to the impact receiving surface of the container such that the coating protects the container against physical blows and impacts.

5,180,191

BAND FOLDER WITH INTEGRAL HANDLES

Gregory A. Biba, Janesville, Wis., assignor to G. LeBlanc Corporation, Kenosha, Wis.

Continuation of Ser. No. 681,553, Apr. 5, 1991, abandoned. This application Feb. 14, 1992, Ser. No. 837,534
Int. Cl.[5] B42D *17/00*
U.S. Cl. 281—45 **6 Claims**



1. A band folder for retaining material, such as sheet music, useful in musical arts comprising: a plurality of joined panels each having a free top edge, a free bottom edge, a joined side edge along which the panels are joined and a free side edge opposing the joined side edge; an aperture disposed through each of the joined panels adjacent its free side edge, with the apertures being in conjunctive alignment with each other and being offset upwardly with respect to a center line of the band folder for providing carrying means said center line being parallel to said free bottom edge; the carrying means being of dimensions sufficient for accepting a user's finger; means for retaining material disposed adjacent the free bottom edge of at least one of the joined panels; and the carrying means being located for promoting retention of material in the means for retaining material and so that the user's finger embraces the free side edges of of the joined panels when a user carries the band folder by the carrying means.

5,180,192

LOST PERSONAL ACCESSORY ITEM IDENTIFICATION AND RETURN METHOD AND ARTICLES

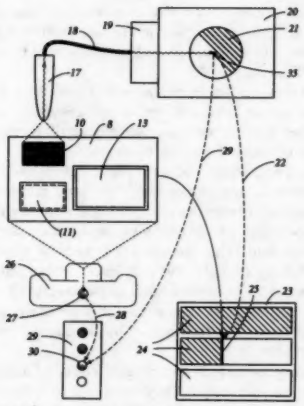
William S. Herbert, 9515 Admiral Lowell NE., Albuquerque, N. Mex. 87111

Filed Apr. 30, 1990, Ser. No. 516,677
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—101 **1 Claim**

1. A mailable card containing

(a) the address of a central registry,

(b) a peel-off and reaffixable adhesive label upon which can be written the name and mailing address of a registrant,



(c) a peel-off and reaffixable adhesive label upon which appears a barcode label identifier,

(d) a printed barcode matching said barcode label identifier.

5,180,193

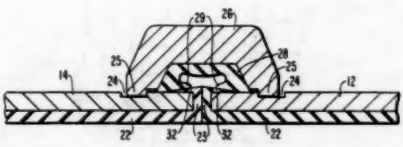
ELASTOMER-LINED METAL PIPE

Robert Rung, Hopatcong, and Douglas R. Dole, Whitehouse Station, both of N.J., assignors to Victaulic Company of America, Easton, Pa.

Filed Dec. 19, 1991, Ser. No. 810,520

Int. Cl.[5] F16L *55/04*

U.S. Cl. 285—55 **6 Claims**



1. Lined metal pipe of a type having a continuous impervious coating of an elastomeric material on an inner periphery thereof and on radial end surface thereof, further comprising, a terminal portion of said continuous coating contiguous with said coating on said radial end surface and directly contacting and extending axially of an outer periphery of said pipe, further comprising said terminal portion progressively decreasing in thickness from said radial end surface of said pipe to the axial termination of said portion at a position spaced axially from said radial end surface, in which said terminal portion is in the form of an annulus having a radially outer surface providing a frustum of a cone.

5,180,194

AUTOMOTIVE AIR-CONDITIONING SYSTEM

Alan R. Allread; Dennis B. Chichester, both of Jackson; Russell L. Rogers, Munith, all of Mich., and Steven M. Knowles, Woodburn, Ind., assignors to Aeroquip Corporation, Maumee, Ohio

Filed Nov. 21, 1991, Ser. No. 795,444

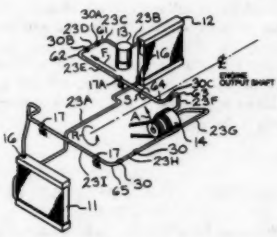
Int. Cl.[5] F16L *27/06*

U.S. Cl. 285—166 **20 Claims**

6. A connector for joining together an end of a first length of tubing and an end of a second length of tubing comprising:

(a) an end portion on said first length having an exterior surface defining a segment of a sphere having a predetermined diameter and a passageway extending therethrough and terminating in an open end;

(b) an enlarged receiving end on said second length, said enlarged receiving end including a segment having a cylindrical interior surface with a diameter larger than said predetermined diameter, an intermediate section tapering from said enlarged receiving end to a size smaller than said predetermined diameter, said first length end portion being received within said enlarged receiving end with a space between said spherical exterior surface and said cylindrical interior surface and the interior surface of said tapering intermediate section;



(c) bearing means in at least two portions of said space, each of said bearing means having a cylindrical surface engaged with said cylindrical interior surface and a spherically shaped surface engaged to said spherical exterior surface;

(d) seal means between said bearing means encircling said spherical exterior surface in sealing relationship therewith and sealingly engaged with said cylindrical interior surface; and,

(e) radially inwardly extending flange means engaged to one of said bearing means.

5,180,195

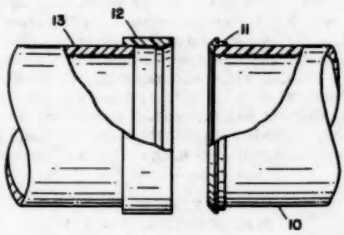
JOINT LOCKING SYSTEM FOR PIPE

Larry J. Petroff, Duluth, Ga., and James H. Miller, Reno, Nev., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Filed Jul. 10, 1991, Ser. No. 727,772

Int. Cl.[5] F16L *21/02*

U.S. Cl. 285—231 **7 Claims**



1. A slip fit type joint for connecting a smooth walled end portion of a pipe to fittings or other pipe comprising:

(a) generally cylindrical pipe having at least one smooth walled end and a generally annular gasket attached to the end such that the gasket contacts both the end surface of the pipe and the outer surface of the pipe adjacent its end;

(b) a generally cylindrical plastic bell attached to the end of a fitting or pipe, the bell having, at its unattached end:

(i) a first inner bell surface which tapers inwardly from a first inside diameter at the unattached end of the bell, the first inside diameter being greater than the outside

diameter of the gasket, to a second inside diameter which is greater than the outside diameter of the smooth walled end of the pipe to which the gasket is attached, but smaller than the outside diameter of the gasket;

(ii) a second inner bell surface, inward of and adjoining the first inner bell surface, having an inside diameter essentially the same as the second diameter of the first inner bell surface;

(iii) a third inner bell surface, inward of and adjoining the second inner bell surface, having an inside diameter greater than the inside diameter of the second inner bell surface, but smaller than the outside diameter of the gasket; and

(iv) a fourth inner bell surface which is essentially perpendicular to and connects the second and third inner bell surfaces;

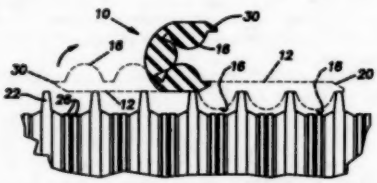
the pipe with the attached gasket being telescopically fittable into the bell such that the gasket fits inward of the fourth inner bell surface and abuts the third and fourth inner bell surfaces.

5,180,196

METHOD OF INSTALLING A RIBBED SLEEVE GASKET ADAPTER

James W. Skinner, Fort Wayne, Ind., assignor to Press-Seal Gasket Corporation, Fort Wayne, Ind.

Filed May 20, 1991, Ser. No. 702,332
Int. Cl.[5] F16L *21/02*
U.S. Cl. 285—253 **1 Claim**



1. A method of installing a gasket adapter on a conduit comprising the steps of providing a conduit having a surface characterized by a multiplicity of peaks and valleys, providing a gasket adapter having a smooth, cylindrical inner surface, and an outer surface having a plurality of peaks and valleys substantially complementary to the shape of the peaks and valleys of the conduit, the inside diameter of said adapter being slightly less than the outside diameter of the peaks of said conduit, axially inserting said gasket adapter on said conduit so that the smooth, cylindrical surface tightly embraces the peaks of said conduit, inverting said gasket adapter by axially and radially pulling one end of said gasket adapter until the adapter is turned insideout with the peaks of said adapter entering the valleys of said conduit and with the cylindrical valley portions of said adapter tightly embracing the peaks of said conduit.

5,180,197

PIPE JOINTING SYSTEM

Ernest R. Thompson, Jr., P.O. Box 144, Girard, Kans. 66743

Filed Oct. 7, 1991, Ser. No. 772,215
Int. Cl.[5] F16L *17/025*
U.S. Cl. 285—351 **2 Claims**

1. A system for joining first and second pipes each having an open end and an outer surface, which comprises:

(a) a coupling shell having a generally cylindrical configuration with first and second open shell ends positioned opposite each other and a shell bore extending longitudinally between and open at said ends, said shell comprising a semi-rigid material;

(b) a coupling sleeve including:

(1) a generally cylindrical configuration;

(2) opposite first and second open sleeve ends;

(3) a sleeve bore extending between and open at said sleeve ends;

(4) said sleeve comprising an elastomeric material;

(5) said sleeve being fastened to said shell within said shell bore with said sleeve ends substantially flush with said shell ends;

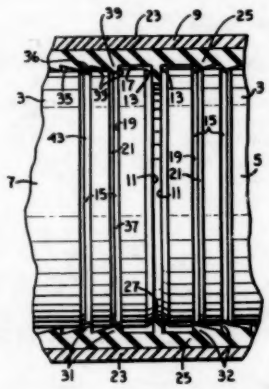
(6) an annular sleeve rib extending radially inwardly from said sleeve bore and positioned generally medially between said sleeve ends, said sleeve rib forming a generally circular sleeve rib opening;

(7) first and second sets of sleeve ridges each positioned between a respective sleeve end and said sleeve rib;

(8) each said ridge set comprising a plurality of adjacent, juxtaposed, annular, non-pitched, continuous ridges;

(9) each said ridge having a first annular edge extending generally radially inwardly into said bore and a second annular edge with a medially-converging orientation, said ridge edges intersecting at a generally circular line of intersection forming an inside diameter of said coupling sleeve;

(10) respective first and second edges of adjacent ridges intersecting at generally circular line intersections with greater diameters than said sleeve inside diameter; and



(11) first and second annular flats each located between a respective ridge set and said rib;

(c) each said pipe including:

(1) a chamfered edge at the end thereof; and

(2) first and second pipe end grooves each having a groove first wall extending generally radially inwardly from said pipe outer surface; a groove second wall converging radially inwardly from said pipe outer surface in a direction toward said pipe end; an annular pipe groove flat located between said pipe groove walls in generally parallel relation with respect to said pipe outer surface; and a generally circular line of intersection between said pipe groove second wall and said pipe outer surface;

(d) first and second pipe end annular sealing intersections formed between each pipe end and said sleeve rib;

(e) a plurality of annular pipe groove first wall intersections each formed between a respective pipe groove first wall and a respective ridge first edge; and

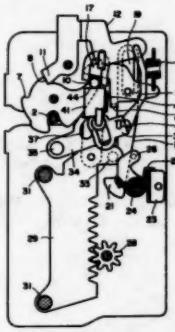
(f) a plurality of annular ridge second edge sealing intersections each formed at an intersection of a respective sleeve ridge second edge and a respective pipe groove circular intersection line.

5,180,198

MOTOR DRIVEN LOCK DEVICE FOR TRUNK LID AND THE LIKE

Shuji Nakamura, and Mitsuru Tamiya, both of Nirasaki, Japan, assignors to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1992, Ser. No. 834,084
Claims priority, application Japan, Feb. 16, 1991, 3-44487
Int. Cl.[5] E05B *53/00*; E05C *3/26*
U.S. Cl. 292—201 5 Claims



1. An electric driven lock device comprising:

a spring-returned latch rotatably mounted on a base and having a U-shaped groove for engaging a striker of said lock device,

a spring-returned ratchet rotatably mounted on said base and engaged to said latch after said latch rotates to a closed-lid position thereby preventing said latch from rotating to an open-lid position,

a pressing link slidably engaged to said latch for rotating said latch to said closed-lid position from an open-lid position,

a relief link rotatably engaged to said ratchet for lifting said ratchet and permitting said latch to rotate to said open-lid position,

motor driven actuator means for slidably engaging said pressing link when moving in a first direction and slidably engaging said relief link when moving in a second direction,

said motor driven actuator means moving said pressing link to rotate said latch into said closed-lid position when moving in said first direction and rotating said relief link to permit said latch to rotate to said open-lid position when moving in said second direction,

a manual relief lever connected to said pressing link and to said ratchet to permit manual operation,

wherein, said manual relief lever produces said open-lid position by moving said pressing link from slidable engagement with said latch and lifting said ratchet from engagement with said latch.

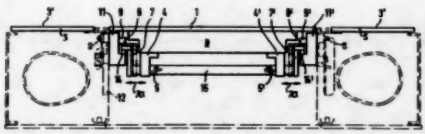
5,180,199

APPARATUS FOR LOCKING AND UNLOCKING A FLAP DOOR, ESPECIALLY IN AN AIRCRAFT

Thorsten Teichmann, and Volker Allerding, both of Bremen, Fed. Rep. of Germany, assignors to Deutsche Airbus GmbH, Hamburg, Fed. Rep. of Germany

Filed Jan. 24, 1992, Ser. No. 825,627
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1991, 4102272
Int. Cl.[5] E05C *17/12*
U.S. Cl. 292—259 8 Claims

1. A locking mechanism for locking and unlocking a flap door, for example, in a floor separating two decks in a commercial aircraft, comprising a flap door tiltable into a passenger space, a bearing block secured to said flap door, comprising two sets of locking means arranged mirror-symmetrically relative to a central plane passing vertically through the flap door when the flap door is closed, said locking means being arranged near opposite edges of said flap door, said locking mechanism further comprising journal means for journalling said sets of locking means, each set of locking means comprising a bell crank lever journalled to said bearing block, said bell crank lever having a first means for operating said bell crank



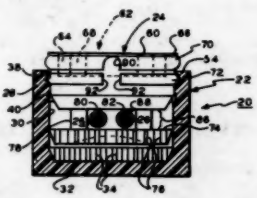
lever and a second means forming a lever arm for operating as a locking and unlocking element, a locking roller journalled to a free end of said lever arm, a locking claw secured to said floor for engagement with said locking roller, biasing means for biasing said locking claw into a locking position, and guide means for said locking roller arranged so that said locking roller can roll along said guide means after disengagement of the locking roller from the locking claw, whereby said mechanism can be unlocked before tilting said flap door.

5,180,200

ROTATABLE SEAL

George Georgopoulos, Pine Brook, and Richard Gnoinski, North Arlington, both of N.J., assignors to E. J. Brooks, Newark, N.J.

Filed Sep. 25, 1990, Ser. No. 587,963
Int. Cl.[5] B65D *33/34*
U.S. Cl. 292—326 22 Claims



1. An improved seal of the type which includes a flexible wire insertable through an item to be secured, the seal being non-removably affixable to the wire to prevent opening operation of the item absent rendering the wire or the seal disintegral, such disintegrity providing a visual indication that such operation has been attempted or has occurred; wherein the improvement comprises:

a walled housing defining a chamber and having first and second aligned bores formed therethrough on opposite sides of the chamber;

a rotor conformally receivable in the chamber and having a third bore therethrough;

first means

(a) for holding the rotor partially inserted in the chamber with the third bore coplanar with the first and second bores,

(b) for permitting the partially inserted held rotor and the housing to be easily relatively rotated about an axis generally transverse to the axis of the bores to align the coplanar bores for receipt of the wire through all thereof, and

(c) for permitting the partially inserted and held rotor and the housing to be relatively rotated after insertion of the wire through the bores so as to partially wrap and deform the received wire about the rotor;

second means for preventing inadvertant non-alignment of the bores prior to receipt of the wire in the bores and following alignment-effecting relative rotation of the partially inserted rotor and the housing until the rotor and the housing are relatively rotated to wrap and deform the wire; and

third means for holding the rotor fully inserted in the chamber following wrapping and deformation of the wire and for preventing relative rotation of the fully inserted rotor and the housing.

5,180,201

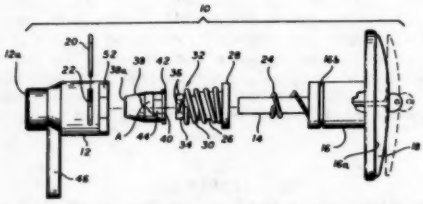
CAMPER SHELL LATCH WITH INSIDE SAFETY RELEASE

Peter Hauber, 9901 Helen Ave., Sunland, Calif. 91040

Filed Apr. 16, 1992, Ser. No. 869,921

Int. Cl.[5] E05B *13/00*

U.S. Cl. 292—336.3 **17 Claims**



1. Camper shell door latch comprising inside latch means operated by a handle and an outside lockable shaft, and first and second relatively shiftable elements respectively acted on by said shaft and fixed to said latch means, said elements being engaged with each other in one position to block latch means operation in the locked condition of said shaft and disengaged from each other in a second, relatively shifted position while maintaining the outside locked condition of said shaft, whereby said latch means is operable from within said camper shell to unlatch said door while said shaft is locked from the outside.

5,180,202

SUN VISOR FOR AUTOMOBILES

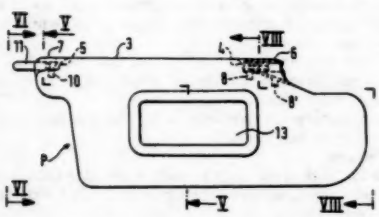
Carlos Gabas, Barcelona, Spain, assignor to Industrias Techno-Matic S.A., Barcelona, Spain

Continuation of Ser. No. 529,909, May 29, 1990, abandoned. This application Oct. 25, 1991, Ser. No. 783,616

Claims priority, application Spain, Jun. 5, 1989, 8901819

Int. Cl.[5] B60J *3/02*

U.S. Cl. 296—97.9 **2 Claims**



1. A sun visor for automobiles, comprising a single stiff plastic hollow one-piece base structure consisting of a blown polyethylene mass and including a longitudinal edge having opposite ends and cavities formed in said polyethylene mass of said one piece base structure at said opposite ends; and mounting means consisting of a first supplementary stiff plastic end member received in one of said cavities in said polyethylene mass at one of said opposite ends and having a recess for receiving a pin that supports said sun visor in an automobile roof, a spring located in said first supplementary stiff plastic end member, and a second supplementary stiff plastic end member received in the other of said cavities in said polyethylene mass at another one of said opposite ends and comprising an attachment extension to be received in a hole in the automobile roof.

5,180,203

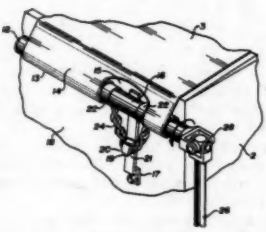
TRUCK BOX TARPAULIN ASSEMBLY

John W. Goudy, P.O. Box 2199, Drumheller, Alberta, Canada T0J 0Y0

Filed Jun. 5, 1992, Ser. No. 894,459

Int. Cl.[5] B60J *11/00*

U.S. Cl. 296—98 **1 Claim**



1. An assembly for alternatively rolling or unrolling a generally rectangular tarpaulin to correspondingly uncover or tautly cover the top opening of an open-topped box having first and second side walls, said tarpaulin being secured along its first side edge to the first side wall of the box, said assembly comprising:

a plurality of downwardly opening hooks attached to the second side wall of the box at points spaced along the length of the wall, each hook having a downwardly directed inlet;

a roller secured to the tarpaulin along its second side edge, said roller being operative to roll up the tarpaulin thereabout when rotated in one direction and to unroll the tarpaulin when rotated in the opposite direction;

the hooks, roller and tarpaulin along its second side the roller hangs alongside the box second side wall in close proximity to the hooks when the tarpaulin is fully unrolled;

a plurality of loops attached to the roller so as to depend therefrom at points spaced along its length, said loops corresponding in location with the hooks, each loop being adapted to extend below the corresponding hook when the tarpaulin is fully unrolled to position the lower end of the loop beneath and in alignment with the hook inlet so that, if the roller is reverse-rolled from the fully unrolled position, the roller will raise the loop ends through the hook inlets and bring them into restraining engagement with the hooks, whereby the tarpaulin may be tensioned by additional reverse-rolling; and

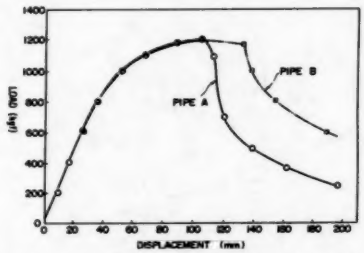
a crank assembly attached to one end of the roller, for inducing rotation of the roller, said crank assembly being adapted to be locked to the box to look the loops and tarpaulin to the hooks in an engaged state.

5,180,204

HIGH STRENGTH STEEL PIPE FOR REINFORCING DOOR OF CAR

Hidenori Shirasawa, Hyogo; Yoshiki Tanaka, Akashi, and Shinji Sawaki, Nagoya, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe and Sango Co., Nagoya, both of, Japan

Filed Sep. 18, 1991, Ser. No. 761,373
Claims priority, application Japan, Sep. 20, 1990, 2-253386
Int. Cl.[5] C22C *38/00*
U.S. Cl. 296—146 C **6 Claims**



6. In a door of a car incorporated with a steel pipe as a reinforcing member inside a door main body, said steel pipe comprising a steel pipe made by seam-welding a steel sheet, wherein a ratio (Hv_1/Hv_2) of a minimum hardness Hv_1 in a softened area of a weld affected zone to an average hardness Hv_2 in a base material satisfies the following formula,

$$-0.001\sigma B+1.05 \geqq Hv_1/H_{2} \geqq -0.003\sigma B+1.05$$

wherein

σB: tensile strength (kgf/mm^2) and

Hv_1, Hv_2: Vickers hardness

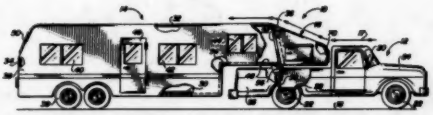
and a ratio ($\sigma y/\sigma B$) of a yield strength σy to a tensile strength σB of a pipe is 0.7 or more.

5,180,205

TRAILER ASSEMBLY AND METHOD

Ralph E. Shoop, RD #1 Box 251, Ashland, Pa. 17921

Continuation-in-part of Ser. No. 502,243, May 21, 1990, abandoned. This application Feb. 18, 1991, Ser. No. 657,711
Int. Cl.[5] B60P *1/00*; B62D *35/00*
U.S. Cl. 296—181 **7 Claims**



1. In the combination of a pick-up truck having a 5th wheel hitch in its cargo bed and a 5th wheeler recreational vehicle trailer having a front end which extends above said cargo bed for coupling with said 5th wheel hitch to

be thereafter towed by said pick-up truck, said 5th wheel hitch being conventionally positioned above the rear wheels of said truck, said coupling of said front end of said trailer with said hitch positioning said front end a significant distance behind the cab of said truck to produce a void behind said cab, said void producing a disruption of air flow between said cab and said front of said trailer, said disruption of air flow requiring more towing power from said truck at poorer fuel efficiency, the improvement comprising:

extension means coupled to said trailer for extending said front end in a tapered configuration above said truck bed toward said truck cab and generally occupying said void for producing a generally streamlined air flow past said cab and over said trailer thereby reducing said towing power requirement and increasing fuel economy; and

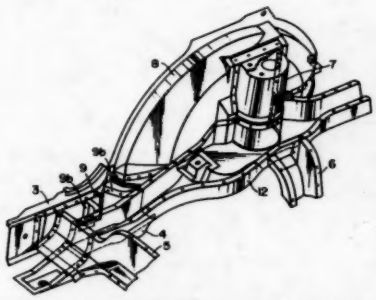
said extension means having a front face adjacent to the rear of said cab, said front face having a smaller cross section than that of the rear of said cab, whereby air flows smoothly past said cab and over said extension means.

5,180,206

STRUCTURE FOR VEHICULAR BODY OF AUTOMOTIVE VEHICLE

Nubuo Toyoda, Kakegawa, Japan, assignor to Suzuki Motor Corporation, Shizuoka, Japan

Continuation-in-part of Ser. No. 385,810, Jul. 26, 1989, abandoned. This application Apr. 4, 1991, Ser. No. 680,312
Claims priority, application Japan, Jul. 19, 1988, 63-95510[U]; Jul. 28, 1988, 63-189466
Int. Cl.[5] B62D *23/00*
U.S. Cl. 296—204 **7 Claims**



1. A suspension structure for a motor vehicle body, comprising: a side sill extending in a longitudinal direction of the vehicle body; rear floor side members; a brace fitting member connected to said side sill and connected to said rear floor side members; a vehicle body rear floor, said vehicle body rear floor being connected to said side sill and connected to said rear side members to connect said side sill and side rear floor side members through said rear floor; a lower control arm including a forward end; a suspension bracket connecting said lower control arm forward end to said brace fitting member, said side sill and said rear floor side members, said bracket defining a fixing seat for receiving said lower control arm forward end, said fixing seat extending slatwise with respect to said side sill.

5,180,207

HEADREST FOR USE IN MOTOR VEHICLES HAVING PIVOT MEMBERS, RESILIENT STRIP AND FRICTION BANDS

Reinhard Schmidt, Lennestadt, Fed. Rep. of Germany, assignor to R. Schmidt GmbH, Lennestadt, Fed. Rep. of Germany

Filed Jul. 17, 1991, Ser. No. 733,031
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1990, 9010690; Dec. 19, 1990, 9017115; Jun. 18, 1991, 9107485
Int. Cl.[5] A47C *7/00*
U.S. Cl. 297—408 **17 Claims**

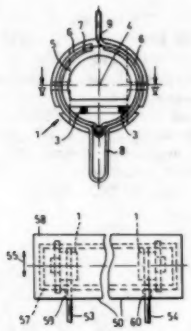
1. A headrest for use in an automotive vehicle and adapted to be supported therein upon support rods, said headrest comprising:

a headrest frame;

a headrest body on said frame;

a pair of pivot members received in said body, engaged by said rods and formed with respective brake stubs, said pivot members defining a pivot axis about which the headrest body and frame are limitedly pivotal relative to said rods, said brake stubs being centered on said axis;

at least one resilient strip held nonrotatably in said frame and forming a brakeshoe braced against each of said brake stubs and shaped to extend over at least a major portion of a periphery thereof for preventing unintentional angular displacement of said body relative to said pivot members,



said strip being composed of spring steel or synthetic resin material; and

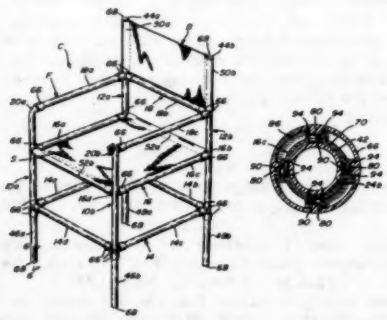
a band of friction-increasing material selected from the group which consists of plastic, rubber and rubber substitutes between said strip and the respective periphery of the respective brake stub.

5,180,208

QUICK-DISCONNECT KNOCKDOWN FURNITURE HAVING A FLEXIBLE SUPPORT WITH A PLURALITY OF FRAME MEMBER STORAGE POCKETS

Victor Lawandi, 2140 Robichaud, St-Laurent, Quebec, Canada H4K 2H1

Filed Feb. 5, 1991, Ser. No. 650,585
Int. Cl.[5] A47C *7/00*
U.S. Cl. 297—440 **13 Claims**



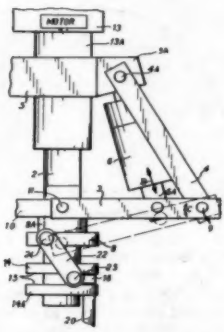
1. A knockdown furniture comprising a series of elongated members slidably interconnected and forming an entirely storable knockdown frame of said furniture, flexible panel means removably mounted on said frame and forming a support means of said furniture, said flexible panel means including two opposed end sections having connectable fastening means joinable to form a storage sleeve, a plurality of similar parallel pocket means being provided side-by-side on a side on said flexible panel means between said end sections, said pocket means being located within said sleeve when said end sections are joined one to the other in a storage position, said sleeve and said pocket means having a capacity sufficient for receiving all of said elongated members of the knockdown frame when dismantled for ready storage thereof.

5,180,209

APPARATUS FOR CUTTING RECESSED GROOVES INTO CONCRETE AND ROCK MATERIAL

Hans Bieri, Pfaeffikon, Switzerland, assignor to Hydrostress AG, Pfaeffikon, Switzerland

Filed Oct. 11, 1991, Ser. No. 775,829
Int. Cl.[5] E21B *10/32*
U.S. Cl. 299—41 **7 Claims**



7. An apparatus for cutting recessed grooves into concrete and rock material, comprising at least three material removing tools, rotatable drive means for rotating said tool, at least one pivotable shaft arranged in parallel to a rotatable drive shaft, means for rotating said pivotable shaft together with the rotatable drive shaft, radial tool drive means including motion translation link members arranged for converting an axial motion of a linearly movable drive device into a pivoting motion of said pivotable shaft about its own longitudinal axis independently of any rotation of said rotatable drive shaft, said material removing tool being connected to a lower end of said pivotable shaft for cutting a recessed groove, and wherein said at least three material removing tools are connected to respective three pivotable shafts, said tools and shafts being arranged with uniform angular spacings around said drive shaft.

5,180,210

CHISELING APPARATUS

David M. Lister, 3380 Blacklick Eastern Rd., Baltimore, Ohio 43105

Filed Apr. 15, 1991, Ser. No. 685,054
Int. Cl.[5] E21C *37/26;* **F23J** *3/00*
U.S. Cl. 299—70 **12 Claims**

1. Chiseling apparatus for use in a chimney comprising,

an elongated positioning rod having a handle end and a free end, said rod having an axis,

said free end being connected to a cylindrical housing coaxially aligned with the axis of the free end of said positioning rod,

an air driven piston and cylinder combination being mechanically mounted within said housing,

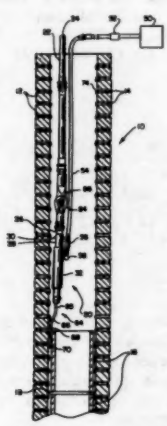
said piston being configured to reciprocate within said cylinder in response to air under pressure delivered to said cylinder,

said cylinder including an air inlet opening located within said housing and a piston rod opening facing away from said free end of said positioning rod,

a piston rod connected to said piston and extending through said piston rod opening in said cylinder and beyond said housing, a chisel connected to reciprocate with said piston and piston rod, said chisel including a chisel edge for

impacting on surfaces within said chimney, said chisel edge being off-set from the axis of said housing,

an opening through said housing, said housing opening circumscribing an air duct, said duct being connected in fluid communication both with a source of high pressure air and with said air inlet opening in said cylinder, said



duct extending along said positioning rod within said chimney,

said handle end of said positioning rod extending upwardly from said chimney, a valve in said duct intermediate said air source and said cylinder for opening and closing said duct to air flow, said valve being located near said handle end of said positioning rod.

5,180,211

BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES WITH ELECTRONICALLY CONTROLLED BRAKE FORCE DISTRIBUTION AND WITH ANTI-LOCK CONTROL

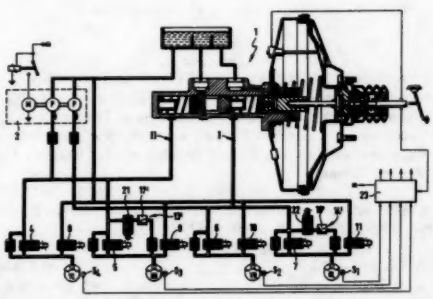
Lutz Weise, Mainz; Helmut Fennel, Bad Soden, and Hans Wupper, Friedrichsdorf/Ts., all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 14, 1991, Ser. No. 699,863

Claims priority, application Fed. Rep. of Germany, May 16, 1990, 4015747

Int. Cl.[5] B60T *8/26*

U.S. Cl. 303—9.63 **3 Claims**



1. A hydraulic antilock brake system for the front and rear wheels of an automotive vehicle with a front and rear brake distribution control comprising:

a foot operated braking pressure generator;

an auxiliary pressure supply;

a pressure compensation reservoir;

at least one front wheel brake in fluid communication with said pressure generator and auxiliary pressure supply through a normally open electromagnetically actuatable inlet valve and with said reservoir through an electromagnetically operable normally closed outlet valve;

at least one rear wheel brake in fluid communication with said pressure generator and said auxiliary pressure supply through a normally closed electromagnetically actuatable main inlet valve, and in fluid communication with said reservoir through a normally-closed electromagnetically actuatable outlet valve;

front and rear wheel sensor generating signals corresponding to said front and rear wheel rotational behavior;

a control circuit operative to generate inlet and outlet valve actuation signals in response to said sensor signals to operate said front and rear inlet and outlet valves so as to eliminate slip conditions;

a supplemental normally open electromagnetically actuatable inlet valve connecting said pressure generator and auxiliary pressure supply in parallel to said main inlet valve;

a brake force regulator connected in series with said supplemental inlet valve operative to regulate rear wheel brake pressure relative to front wheel brake pressure with said supplemental inlet valve open;

said control circuit operative to close said supplemental inlet valve and open said main inlet valve upon initiation of brake actuation.

5,180,212

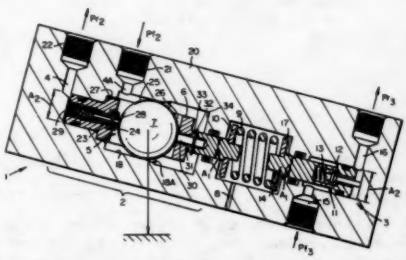
DUAL BRAKE PRESSURE REDUCING VALVE ASSEMBLY USING SINGLE INERTIA RESPONSIVE MEMBER

Glyn P. R. Farr, Leek Wootton, United Kingdom, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Apr. 9, 1991, Ser. No. 682,077

Int. Cl.[5] B60T *8/28*

U.S. Cl. 303—9.68 **14 Claims**



1. A brake pressure reducing valve assembly for a vehicle comprising:

a valve body;

first and second normally open valve means for controlling communication between respective associated inlet and outlet chambers;

said first valve means comprising a first inlet chamber within said valve body connectable to a source of brake actuating fluid, a first outlet chamber within said valve body and connectable to a brake actuator, a first brake pressure responsive piston slidably mounted in said valve body separating said first inlet chamber from said first outlet chamber, a first valve seat on said first piston in said first inlet chamber, and a deceleration responsive first valve member movably mounted in said first inlet chamber and engageable with said first valve seat for maintaining said first valve means normally open when the deceleration of

the vehicle is below a first threshold value and for engaging said first valve seat for closing said first valve means when the deceleration of the vehicle reaches a second threshold value, said first valve member being movable in said valve body in response to pressure in said first inlet chamber produced by said source of brake actuating fluid; and

said second valve means comprising a second inlet chamber within said valve body and connectable to a source of brake actuating fluid, a second outlet chamber in said body and connectable to a brake actuator, a second brake pressure responsive piston slidably movable in said valve body separating said second inlet chamber from said second outlet chamber and movable in response to pressure in said second inlet chamber produced by said source of brake actuating fluid connected to said second inlet chamber, a second valve member between said second inlet and outlet chambers, a second valve seat on said second piston engageable with said second valve member for closing said normally open second valve means in the engaged positions, compression spring means in said valve body and operatively mounted between said first and second pistons for urging said pistons in a direction away from each other, so that said pistons are moved towards each other against the force of said compression spring means to affect closing of said first and second valve means, the force required to move said second piston towards said first piston against the force of said compression spring means in any position of said first piston is determined by the position of said first piston, and when said first piston moves in response to brake pressure in said first inlet chamber exceeding a predetermined value and the deceleration of the vehicle is below said first threshold value said first valve member and said first valve seat move with said first piston to maintain separation between said first valve member and said first valve seat until deceleration of the vehicle reaches said second threshold valve.

5,180,213

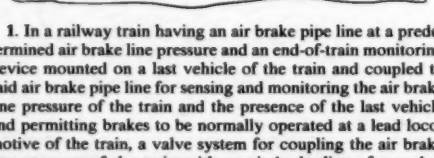
BRAKE PIPE CONTINUITY VALVE SYSTEM

Ronald L. Kingsbury, Roanoke, Va., assignor to Norfolk Southern Railway Co., Norfolk, Va.

Filed Mar. 12, 1992, Ser. No. 850,021

Int. Cl.[5] B60T *11/26*

U.S. Cl. 303—86 **4 Claims**



1. In a railway train having an air brake pipe line at a predetermined air brake line pressure and an end-of-train monitoring device mounted on a last vehicle of the train and coupled to said air brake pipe line for sensing and monitoring the air brake line pressure of the train and the presence of the last vehicle and permitting brakes to be normally operated at a lead locomotive of the train, a valve system for coupling the air brake line pressure of the train with an air brake line of a pusher locomotive to facilitate normal operation of the brakes at the lead locomotive, the valve system comprising a valve housing coupled to said air brake pipe line, said valve housing also being coupled to an air brake pipe hose of the pusher locomotive, a valve in said housing for blocking communication between said air brake pipe line and said air brake pipe hose in a closed position of said valve, said valve being manually movable within said housing to an open position establishing communication between said air brake pipe line and said air brake pipe hose, whereby normal operation of the brakes at the lead locomotive of the train is facilitated without the need for removing the end-of-train device from the last vehicle and without the need for uncoupling the device from said air brake pipe line.

5,180,214

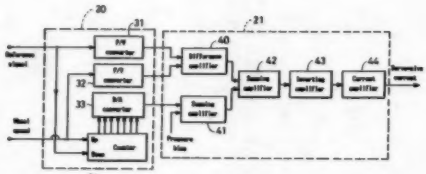
SERVO-TYPE PHASE-LOCKED LOOP ANTI-SKID BRAKE CONTROL SYSTEM

Edge C. Yeh, Hsinchu, and Jiunn Y. Wang, MiaoLi, both of Taiwan, assignors to National Science Council, Taiwan

Filed Dec. 30, 1991, Ser. No. 815,818

Int. Cl.[5] B60T *8/82*

U.S. Cl. 303—111 **6 Claims**



1. An anti-skid brake control system for controlling brake mechanisms of a vehicle, the vehicle having at least a first wheel and at least a second wheel, when braking the vehicle the brake mechanisms applying a brake force to the second wheel and the first wheel being under free rolling, the brake control system comprising:

a first wheel speed detector mounted on the first wheel and capable of sending out a periodic first signal, the frequency of which indicating the angular speed of the first wheel;

a second wheel speed detector mounted on the second wheel and capable of sending out a periodic second signal, the frequency of which indicating the angular speed of the second wheel;

a frequency error detector, responsive to the first signal and the second signal, for generating an output frequency error voltage in proportion to the difference between the frequency of the first signal and the second signal;

a phase error detector, responsive to the first signal and the second signal, for generating an output phase error voltage in proportion to the phase error between the first signal and the second signal;

summing means, coupled to said frequency error detector and said phase error detector, for generating an output control voltage, the magnitude of the control voltage being the summation of the frequency error voltage, the phase error voltage, and a predetermined bias voltage;

means, responsive to the control voltage, for driving the brake mechanisms to apply a brake force in accordance with the control voltage to the second wheel.

5,180,215

HYDRAULIC DUAL-CIRCUIT BRAKE SYSTEM

Wolfgang Bernhardt, Korntal; Roland Holzmann, Stuttgart; Guenther Schmidt, Tamm-Hohenstange; Lothar Kirstein, Ditzingen, and Gerhard Wetzel, Korntal, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 19, 1991, Ser. No. 671,610

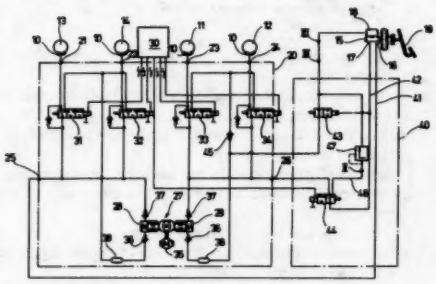
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1990, 4009302; Oct. 16, 1990, 4032784

Int. Cl.[5] B60T *8/32*

U.S. Cl. 303—113.2 **30 Claims**

1. A hydraulic dual-circuit brake system with an anti-skid system and traction control for motor vehicles having driven and non-driven wheels, having a master brake cylinder with first and second separate brake circuit outlets (16, 17) for controlling a brake pressure in first and second brake circuits by actuation of a brake pedal; a brake fluid tank that communi-

cates with the master brake cylinder; a four-channel hydraulic unit (**20**) connected to said first and second brake circuit outlets of the master brake cylinder, said four-channel hydraulic unit has first and second outlet channels (**21, 22**) for connecting brake fluid to wheel brake cylinders (**10**) of the non-driven vehicle wheels (**13, 14**), and third and fourth outlet channels (**23, 24**) for connecting brake fluid to wheel brake cylinders (**10**) of the driven wheels (**11, 12**), first and second electromagnetic control valves (**31** and **32**) associated one each with said first and second outlet channels (**21, 22**) for controlling a brake pressure dependent on wheel slip of said non-driven wheels, third and fourth electromagnetic control valves (**33, 34**) associated one each with said third and fourth outlet channels (**23, 24**) for controlling a brake pressure dependent on wheel slip of said driven wheels, and a return pump (**27**) with first and second separate pumping elements (**28, 29**), said first pumping element (**28**) operative in said first brake circuit, for returning brake fluid from the wheel brake cylinders of said non-driven wheels back to said first brake circuit upon brake pressure reduction, said second pumping element (**29**) operative in said second brake circuit for returning brake fluid from the wheel brake cylinders of said driven wheels back to said second brake circuit upon brake pressure reduction, an inlet side of said first pumping element (**28**) is connected to an outlet side of said first and second electromagnetic control valves with an outlet side



of said first pumping element connected to the first brake circuit outlet of the master brake cylinder; an inlet side of said second pumping element (**29**) is connected to an outlet side of said third and fourth electromagnetic control valves with an outlet side of said second pumping element connected to the second brake circuit outlet of the master brake cylinder; and having a second hydraulic unit (**40**) for generating a brake supply pressure in traction control, said second hydraulic unit has a hydraulically controlled charging valve (**43**), which at least in traction control connects said input side of said second pump element of the return pump with the brake fluid tank, and has a first electromagnetic reversing valve (**44**), incorporated into a connection between an output side of said second pump element and said second brake circuit outlet of the master brake cylinder, said reversing valve, in traction control, disconnects said second pump element on the output side from the master brake cylinder and with an interpolation of a pressure limiting valve (**47**) connects the output side of said second pump element to the brake fluid tank, said second pump element (**29**) of the return pump (**27**) is embodied as a self-aspiring high-pressure pump, and that a check valve (**45**) having a flow direction toward the inlet of said second pump element is incorporated into a line connecting the inlet of said second pump element (**29**) to the third and fourth control valves (**33, 34**) of the second brake circuit associated with the second pump element (**29**).

5,180,216

HYDRAULIC DUAL-CIRCUIT BRAKE SYSTEM WITH ANTI-SKID AND TRACTION CONTROL

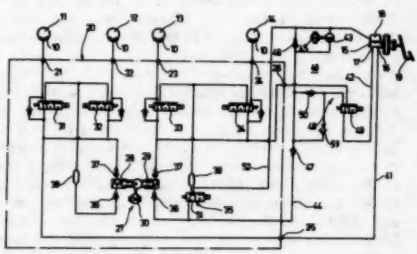
Lothar Kirstein, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 8, 1991, Ser. No. 681,277

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1990, 4017873

Int. Cl.[5] **B60T** *8/34, 13/14*

U.S. Cl. 303—113.2 **15 Claims**



1. A hydraulic dual-circuit brake system for an anti-skid system and traction control for motor vehicles including at least one driven vehicle wheel and a brake cylinder for each at least one driven vehicle wheel;

comprising a master brake cylinder, with first and second separate brake circuit outlets, for controlling a brake pressure by brake pedal actuation;

a brake fluid tank that communicates with the master brake cylinder;

a four-channel hydraulic unit connected to the first and second separate brake circuit outlets of the master brake cylinder, said four-channel hydraulic unit comprises:

first, second, third and fourth outlet channels, distributed to the first and second separate brake circuits, for connecting the first and second separate brake circuits to the wheel brake cylinders of the vehicle wheels,

first, second, third and fourth electromagnetic control valves each having inlets, with one each electromagnetic control valve assigned to one each of said first-fourth outlet channels, for controlling a wheel-slip-dependent brake pressure in the wheel brake cylinders, each of said electromagnetic control valves communicate with one outlet channel and in pairs via one connecting line connected with a respective brake circuit outlet to the master brake cylinder,

a return pump with first and second separate pump elements, said first and second pump elements being operative in said first and second separate brake circuits, respectively, for returning brake fluid to said first and second separate brake circuits upon brake pressure reduction in the wheel brake cylinders, said first and second separate pump elements can each be made to communicate on an inlet side, via the first, second, third, and fourth control valves, with the first, second, third, and fourth outlet channels belonging to one of the first and second brake circuits, and on an outlet side of said first and second separate pump elements to communicate via an additional connecting line, with the brake circuit outlet to the master brake cylinder associated with the brake circuit under brake pressure reduction in the wheel brake cylinders, and

first and second low-pressure reservoirs, each assigned to the first and second brake circuit, respectively, for temporarily holding brake fluid during brake pressure reduction, each of said first and second low-pressure reservoirs is connected to the inlet of the first and second pump element respectively;

and comprising an additional hydraulic unit for furnishing a

brake supply pressure during traction control, said additional hydraulic unit has

a precharging pump that communicates on an inlet side with the brake fluid tank and on an outlet side thereof, via a first check valve (46), with the inlet of the second pump element assigned to said second brake circuit having at least one drivel wheel, said precharging pump upon traction control feeds brake fluid into said third and fourth outlet channels each containing at least one driven wheel, and

a valve unit (49), which upon traction control interrupts the connecting line that connects said second pump element assigned to said second brake circuit having at least one driven wheel to the master brake cylinder and connects the pump element assigned to said second brake circuit to a pressure limiting valve, and

a shutoff element, which disconnects the second low-pressure reservoir from the precharging pump is operative in traction control, and is incorporated between the low-pressure reservoir, assigned to the second brake circuit having at least one driven wheel, and a connection point of the low-pressure reservoir to the second pump element of the return pump (27, 127), said shutoff element is embodied as a 3/2-way magnet valve, including first, second, and third controlled valve connections, the first controlled valve connection communicates with the second low-pressure reservoir, the second controlled valve connection communicates with the inlet of the second pump element, and the third controlled valve connection communicates with the brake fluid tank (18), and that the first valve connection in an unexcited basic valve position, communicates with the second valve connection and, in a reversed valve position, communicates with the third valve connection.

5,180,217

METAL DRAWER SIDES

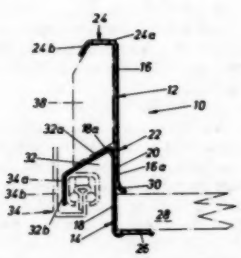
Horst Lautenschläger, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger GmbH & Co. KG, Reinheim, Fed. Rep. of Germany

Continuation of Ser. No. 592,196, Oct. 3, 1990, abandoned. This application Mar. 10, 1992, Ser. No. 849,786

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1989, 3934419

Int. Cl.[5] A47B *88/00*

U.S. Cl. 312—334.7 **2 Claims**



1. A metal drawer side comprising a vertical web formed by an upper vertical web section and a lower vertical web section, a lower portion of said upper vertical web section and an upper portion of said lower vertical web section being superimposed on one another and rigidly fastened together by welding,

said upper vertical web section having an upper marginal area which is bent outwardly substantially at right angles for stiffening said upper vertical web section, and said lower vertical web section having a lower marginal area which is bent in a direction opposite to that of said upper marginal area for stiffening said lower vertical web section and to provide a support for a drawer bottom,

said lower vertical web section having an upper marginal area which is bent in a direction opposite to that in which said lower marginal area thereof is bent in a manner such as to form an open-bottomed channel for concealingly containing a runner of a drawer guide, and

said upper vertical web section having a lower marginal area which is bent arcuately in the same direction as said lower marginal area of said lower vertical web section to form a rounded cove at said lower marginal area of said upper vertical web section, said cove being located above said lower marginal area of said lower vertical web section at a distance to hold said drawer bottom therebetween.

5,180,218

AUTOMOTIVE PROJECTION TYPE HEADLAMP HAVING NO ULTRAVIOLET RAYS OUTPUT

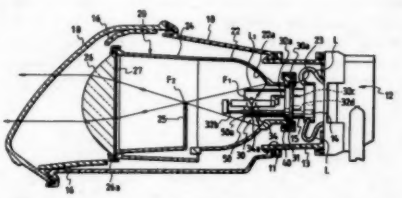
Hirohiko Ohshio, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1992, Ser. No. 850,824

Claims priority, application Japan, Mar. 19, 1991, 3-54596

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 362—61 **24 Claims**



1. An automotive projection-type headlamp comprising:

a headlamp body;

an outer cover mounted on said headlamp body for defining a lamp chamber; and

a projector unit accommodated in said lamp chamber, said projection unit comprising:

a substantially elliptic reflector having a front opening;

a cylindrical holder fixed to said front opening of said reflector;

a projection lens secured to said holder;

a light source comprising a discharge-type bulb located at a first focal point of said reflector;

first ultraviolet (UV) shielding means for cutting off UV rays part of light beams radiating from said discharge bulb and directing toward said reflector; and

second UV shielding means for cutting off UV rays part of light beams passing through said projection lens.

5,180,219

VEHICLE HEADLAMP ASSEMBLY

John D. Geddie, East Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

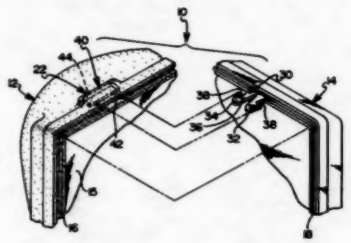
Filed Aug. 5, 1991, Ser. No. 739,968

Int. Cl.[5] F21M *7/00*

U.S. Cl. 362—61 **3 Claims**

1. A vehicle headlamp comprising a reflector housing member provided with at least one concave reflecting surface and having a front open face having an outer margin surrounded by a connector portion around the entire margin of the open face of the reflector housing member, a lens member closing the open face of the reflector housing member and having a connector portion complementary and conforming to the connector portion of the reflector housing member, an elastomeric adhesive located between said connector portions of the reflector housing member and the lens member, a bifurcated tongue portion integrally formed with the lens member, the reflector housing member having a slot portion formed with a tapered entrance section and a lock section adjacent the outer margin of the open face of the reflector housing member, the tongue

portion and the slot portion being located at two or more opposed points along the outer margin of the headlamp for



snap-locking the members together during the curing of the adhesive.

5,180,220

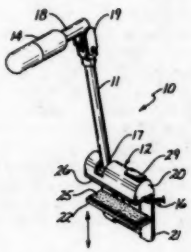
STITCHERY LIGHT-BASE AND CLAMP

Dorothy J. Van Kalsbeek, 25092 Via Las Lomas, Murrieta, Calif. 92362

Continuation-in-part of Ser. No. 588,533, Dec. 6, 1990, abandoned. This application Dec. 16, 1991, Ser. No. 807,492

Int. Cl.[5] F21L *15/20*

U.S. Cl. 362—98 **8 Claims**



1. A stitchery light, comprising:

means in the form of an arm for supporting a lamp; and

means in the form of a base member for supporting the arm on a stitchery implement so that with the stitchery implement disposed in a horizontal position, the arm extends upwardly where it can be pivoted to a desired position above the stitchery implement;

the arm extending from a proximal end portion of the arm to a distal end portion of the arm, and the arm including a lamp component on the distal end portion;

the base member including a capsular component to which the proximal end portion of the arm is pivotally mounted, means in the form of a switch on the capsular component for switching electrical current to the lamp component, a downwardly extending bracket molded integrally with the capsular component in unitary one-piece construction, and a clamping member adjustably mounted on the bracket to work in opposition to the capsular component;

the capsular component being shaped and dimensioned to set atop the stitchery implement without extending significantly radially inward or radially outward from the stitchery implement, the bracket being shaped and dimensioned to extend downwardly from the capsular component closely adjacent the stitchery implement, the bracket including a vertically elongated slot that extends horizontally through the bracket and the clamping member including means in the form of a threaded-shaft-and-knob combination extending horizontally through the vertically elongated slot for adjustably mounting the clamping member to the bracket;

the capsular component, the bracket, and the clamping member being arranged to adjustably mount on the stitchery implement so that with the stitchery implement in a horizontal position, the capsular component bears downwardly on the stitchery implement, the clamping member bears upwardly against the stitchery implement, the proximal end of the arm is disposed above the stitchery implement, and the bracket extends downwardly alongside and closely adjacent the stitchery implement.

5,180,221

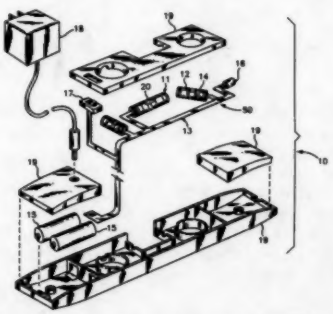
APPARATUS AND METHOD FOR ILLUMINATING A LIQUID FILLED CONTAINER

Brant Yoder, 665 Castle Cliff, Ballwin, Mo. 63021

Filed Feb. 4, 1991, Ser. No. 649,957

Int. Cl.[5] F21V *33/00*

U.S. Cl. 362—101 **32 Claims**



1. An apparatus for illuminating a liquid filled container comprising:

a. a plurality of containers containing a liquid and a bubble within the liquid;

b. a means to selectively illuminate each container and the liquid the means to illuminate enclosed within the container of liquid to illuminate the container, the liquid and the bubble;

c. a means to selectively activate the means to illuminate operatively connected to the means to illuminate the container;

d. a power source connected to the means to illuminate to activate the means to illuminate; and

e. a means for connecting the power source, the means to selectively activate the means to illuminate, and the means to illuminate partly enclosed within the container.

5,180,222

CABINET ALLOWING OBJECT TO BE VIEWED FROM MULTIPLE ANGLES

Douglas J. Robinson, 1649 Kalorama Rd., N.W., Washington, D.C. 20009

Filed Nov. 6, 1991, Ser. No. 788,370

Int. Cl.[5] A47F *11/10*

U.S. Cl. 362—125 **14 Claims**

1. A display cabinet for the display of an object contained therein, the display cabinet comprising:

a) display chamber means for containing the object, the display chamber means being substantially defined by:

1) a plurality of internal reflective surfaces; and

2) a surface having a semi-reflective coating constituting:

i) means for making the object visible to one or more observers through the surface; and

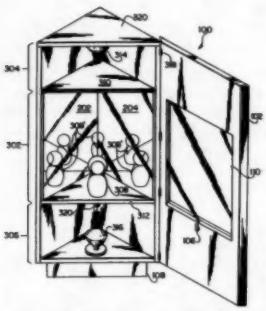
ii) means for preventing formation of a visible reflection of the one or more observers in the surface having the

semi-reflective coating or in the plurality of reflective surfaces;

wherein:

the reflective surfaces are arranged at angles with respect to each other and in physical relation to the surface having the semi-reflective coating to define the display chamber means so that:

1) the object may be simultaneously viewed from different



angles through the surface with the semi-reflective coating, as if the object were free-standing and not enclosed; and

2) an amount of floor space required for thus viewing the object from the different angles through the surface with the semi-reflective coating, is substantially less than that floor space which would be required if the object were free-standing and directly viewed from the different angles.

5,180,223

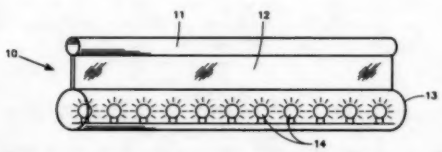
LOW INTENSITY RV LIGHT

Thomas C. McNamee, 2451 Monaco Dr., Oxnard, Calif. 93035

Filed Apr. 30, 1992, Ser. No. 876,033

Int. Cl.[5] F21S *3/00*

U.S. Cl. 362—223 **20 Claims**



1. A portable low intensity, even distribution lighting fixture adapted for simple deployment and removable attachment to an RV awning utility beam, comprising:

a first length of flexible cylinder or tubing for removable insertion into a pre-existing indentation or utility channel in said utility beam;

a rectangular sheet of flexible sheeting extending laterally from said first length of tubing;

a second length of flexible transparent tubing connected to said sheeting's side transversely opposite the side of said sheeting attached to said first length of tubing; and

low-intensity relatively uniformly wide-area illuminating means disposed within said second length of tubing.

5,180,224

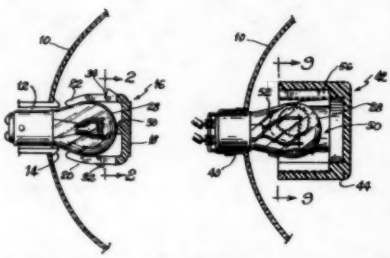
TAIL LIGHT COVER

Oswald C. Svehaug, 1010 San Ysidro Blvd., San Ysidro, Calif. 92173

Filed Feb. 27, 1992, Ser. No. 842,474

Int. Cl.[5] B60Q *1/26*

U.S. Cl. 362—255 **11 Claims**



1. A vehicular light cover to color light emitted from a vehicular lightbulb, said cover comprising:

(a) a colored translucent body shaped and dimensioned to encircle a substantial portion of said lightbulb and color a substantial portion of light emitted from said lightbulb;

(b) a bulb clamp for engaging said body directly onto said lightbulb;

(c) said clamp defining a plurality of pass-through openings therethrough to ventilate heat from said lightbulb; and,

(d) said body and bulb clamp comprising a unitary plastic molding, and said body including a forward substantially solid portion and a rearwardly directed portion comprising a plurality of separate bulb-engaging fingers defining said bulb clamp, and a plurality of interstitial slits defined between said fingers defining said pass-through openings.

5. A vehicle light cover to color light emitted from a vehicular lightbulb, said cover comprising:

(a) a colored translucent body shaped and dimensioned to encircle a substantial portion of said lightbulb and color a substantial portion of light emitted from said lightbulb;

(b) a bulb clamp for engaging said body directly onto said lightbulb;

(c) said body being unitary and said bulb clamp comprising at least two opposed clips extending forwardly from said body to clamp opposed sides of said bulb; and,

(d) each of said clips being a sheet metal stamping defining two parallel side rails, and said body defining a pair of parallel tracks seating said siderails therein.

5,180,225

ROTOR ZONE COOLING APPARATUS FOR ROTORS IN CONTINUOUS MIXERS OF PLASTIC MATERIALS

Joseph R. Piccolo, Sr., Seymour; William H. Swilling, Jr., Shelton; Michael R. Kearney, Milford, and Douglas E. Mosher, Oxford, all of Conn., assignors to Farrel Corporation, Ansonia, Conn.

Filed Jun. 7, 1991, Ser. No. 711,927

Int. Cl.[5] B01F *7/08*

U.S. Cl. 366—147 **22 Claims**

1. Rotor zone cooling apparatus for use in an axial bore in a rotor of a continuous mixer of plastic materials, said rotor zone cooling apparatus comprising:

a coolant feed tube extending axially along the bore from an entrance into the bore to a discharge from the feed tube;

said discharge from the feed tube being positioned near to but spaced axially away from a terminus of the bore for flowing coolant axially within said feed tube from said entrance to said discharge;

the coolant after exiting from said discharge being directly exposed to contact with the terminus of the bore and the coolant returning from the terminus in a downstream flow

direction along a first length of a wall of the bore and being directly exposed to contact with said first length of the bore wall for providing a first cooling zone;

first support means in contact with the bore wall for supporting the feed tube aligned with an axis of the bore;

a first tubing section encircling the feed tube;

said first tubing section being larger in diameter than said feed tube and being smaller in diameter than said bore wall and being supported spaced outwardly from the feed tube and spaced inwardly from the bore wall for forming a first isolation channel located outwardly of the feed tube and located within said first tubing section;

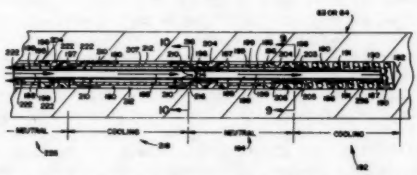
first seal means in sealing contact with the bore wall at a location downstream of said first length of the bore wall and upstream of a second length of the bore wall for preventing coolant from contacting with said second length of the bore wall;

said first isolation channel communicating with the returning coolant at a location upstream of said first seal means for causing coolant to flow through said first isolation channel for providing a first neutral zone extending along said second length of the bore wall;

a second tubing section encircling the feed tube downstream from said first tubing section;

said second tubing section being larger in diameter than said feed tube and being smaller in diameter than said bore wall and being supported encircling the feed tube and spaced inwardly from the bore wall for providing a first cooling channel located outside of said second tubing section;

said first cooling channel extending adjacent to and directly exposed to a third length of the bore wall;



said third length of the bore wall being downstream from said second length of the bore wall;

said first coolant channel communicating with said first isolation channel;

first flow diversion means for diverting coolant flow outwardly from said first isolation channel into said first cooling channel for coolant in said first cooling channel to be in direct contact with the bore wall for providing a second cooling zone along said third length of the bore wall;

second seal means in sealing contact with the bore wall at a location downstream from said second length of the bore wall and upstream from said third length of the bore wall for isolating said second length of the bore wall from said first cooling channel for providing coolant from contact with said second length of the bore wall for separating said second cooling zone from said first neutral zone;

a third tubing section being larger in diameter than said feed tube and being smaller in diameter than said bore wall and being supported encircling the feed tube downstream from said second tubing section;

said third tubing section being spaced outwardly from the feed tube and spaced inwardly from the bore wall for providing a second isolation channel located within said third tubing section;

said second isolation channel extending along a fourth length of the bore wall;

said fourth length of the bore wall being downstream from said third length of the bore wall;

said second isolation channel communicating with said first cooling channel; and

third seal means in sealing contact with the bore wall at a location downstream from said third length of the bore wall and upstream from said fourth length of the bore wall for isolating said fourth length of the bore wall from said third length of the bore wall and for diverting coolant flow inwardly from said first cooling channel into said second isolation channel for providing a second neutral zone extending along said fourth length of the bore wall.

5,180,226

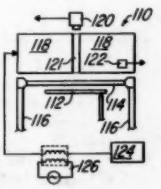
METHOD AND APPARATUS FOR PRECISE TEMPERATURE MEASUREMENT

Mehrdad M. Moslehi, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 30, 1991, Ser. No. 785,386

Int. Cl.[5] G01J *5/06*

U.S. Cl. 374—127 **28 Claims**



1. A system for measuring the temperature of a first heated object in the presence of at least one second radiating object, comprising:

a power source for energizing said second object and heating said first object such that said first and second objects emit radiation with partially overlapping spectral bands;

a first detector for detecting radiation power emitted by said first and second objects;

a modulation source for modulating said power source to a first selected modulation depth and frequency such that the emitted radiation of of said second object varies with said selected modulation depth and frequency and the temperature of said first object remains substantially unmodulated; and

circuitry coupled to said first detector for determining the fraction of radiation emitted by said second object and collected as interference effect in said first detector based upon said modulation depth and determining the temperature of said first object without the interference effect of said second object.

5,180,227

OPTICAL TEMPERATURE SENSORS

Laurence N. John, and Neil A. Corner, both of London, England, assignors to Smiths Industries Public Limited Company, London, England

Filed Sep. 9, 1991, Ser. No. 756,551

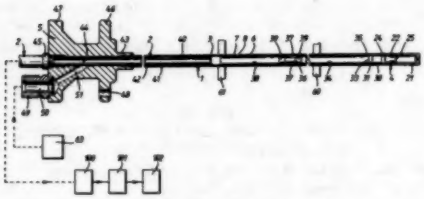
Claims priority, application United Kingdom, Sep. 15, 1990, 9020219

Int. Cl.[5] G01K *13/02, 1/16;* **G01J** *5/08*

U.S. Cl. 374—131 **9 Claims**

1. An optical temperature sensor comprising an outer elongate probe having an optically-transparent element within and exposed close to a forward tip of the probe to a temperature to be measured, an optical radiation guide extending within the probe means for focussing radiation from said optically-transparent element onto said optical radiation guide, a gas passage along the length of said probe, means for supplying cooling gas to said gas passage, and an optically-transparent thermal barrier between a forward end of said optical radiation guide and said optically-transparent element so arranged that said radia-

tion guide and said optically-transparent barrier are exposed to the cooling gas and the optically-transparent element is protected by said optically-transparent barrier from the cooling gas.



5,180,228

RADIATION THERMOMETER FOR MOLTEN IRON AND METHOD FOR MEASURING THE TEMPERATURE OF MOLTEN IRON

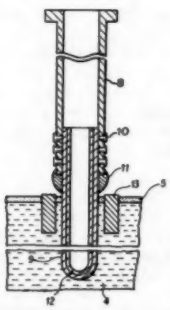
Yoshihiko Tarumi; Atuhisa Takekoshi; Mamoru Inaba; Yoshiro Nishi; Masaaki Sakurai, all of Tokyo; Satoshi Sakamoto, Takasago, and Kimihiko Sato, Tokyo, all of Japan, assignors to Asahi Glass Company Ltd. and NKK Corporation, both of Tokyo, Japan

Continuation of Ser. No. 574,133, Aug. 29, 1990, abandoned. This application Dec. 30, 1991, Ser. No. 816,548

Claims priority, application Japan, Sep. 18, 1989, 1-240993

Int. Cl.[5] G01K *1/12, 1/14;* **G01J** *5/10*

U.S. Cl. 374—139 **12 Claims**



1. A radiation thermometer for molten metal, comprising:

a probe tube having a closed bottom end to be immersed in molten metal and an open top end;

a radiation meter having a sensor port fixed at the open top end of the probe tube to receive radiation emitted from an inner bottom of the probe tube and thereby measure the temperature of the molten metal, wherein said molten metal is molten pig iron or molten steel, the probe tube comprises zirconium boride ceramics and the inner bottom of the probe tube is formed into a spheroidal shape; and

a ring shaped protector disposed to surround around the probe tube and which floats with the surface of the molten metal.

5,180,229

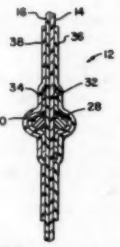
SAMPLING BAG WITH ENCLOSED WIRE ENDS

William P. Niemeyer, Fort Atkinson, Wis., assignor to Nasco International, Inc., Fort Atkinson, Wis.

Filed Mar. 8, 1991, Ser. No. 666,581

Int. Cl.[5] B65D *33/30*

U.S. Cl. 383—91 **5 Claims**



1. In a sampling bag including a front wall and a rear wall joined together along a pair of spaced side edges and a bottom edge to define a cavity, the bag having a removable upper portion adapted to define an opening disposed between the top edges of the front and rear walls, and further having a pair of deformable wire portions extending one from each side edge of the bag and terminating in a wire end, the wire portions being adapted to be bent inwardly to close the top opening of the bag, the improvement comprising a wire cover connected to each wire portion adjacent its wire end and extending past the wire end to enclose the wire end and prevent its contact with the front and rear walls of the bag when the wires are bent inwardly to close the top opening of the bag, wherein the deformable wire portions are connected to the wall of the bag by means of an inner adhesive strip, and wherein the wire cover comprises an outer adhesive strip adhering to and covering the inner adhesive strip and extending outwardly beyond the wire ends, and further comprises an adhering element secured to the outer adhesive strip outwardly of the side edges of the bag for encasing the portions of the wire extending outwardly therefrom, the adhering element including a portion adhering to the outer adhesive strip beyond the wire ends for enclosing the wire ends.

5,180,230

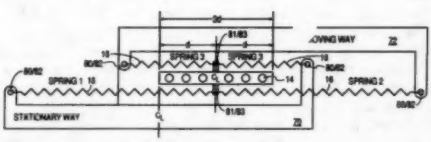
ROLLING ELEMENT CAGE CONSTRAINT

Donald J. McCarthy, deceased, late of Hayward by Darleen D. McCarthy, executor , and Manuel Pastor, Berkeley, both of Calif., assignors to ETEC Systems, Inc., Hayward, Calif.

Filed Jun. 12, 1991, Ser. No. 713,929

Int. Cl.[5] F16C *29/04*

U.S. Cl. 384—54 **6 Claims**



1. A linear bearing assembly comprising:

a stationary part having two ends,

a movable part having two ends,

a sliding component permitting parallel displacement of said movable part in juxtaposition to said stationary part,

and two resilient elements each having two ends, wherein one of the resilient elements having a first end affixed to a first end of the stationary part and the second end of said resilient element affixed to the sliding component, and

the second resilient element having a first end affixed to the sliding component and the second end of said resilient element affixed to a first end of the movable part.

5,180,231

MEMBER FOR RETAINING ROLLING BODIES

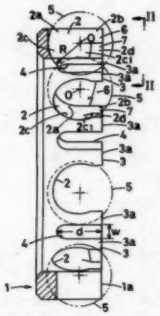
Hiroshi Ueno; Shoji Hatabu; Etsuko Kumata, and Takehiro Adachi, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Dec. 27, 1991, Ser. No. 813,862

Claims priority, application Japan, Dec. 28, 1990, 2-409517; Aug. 6, 1991, 3-196856

Int. Cl.[5] F16C *33/44*

U.S. Cl. 384—527 **8 Claims**



1. A rolling body retaining member comprising a reinforcing fiber, carbon powder and the balance polyether ether ketone resin.

5,180,232

MODULAR PRINTER SYSTEM

George E. Chadima, Jr., Longboat Key, Fla., and Darald R. Schultz, Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Continuation-in-part of Ser. No. 216,868, Jul. 8, 1988, and a continuation-in-part of Ser. No. 227,195, Aug. 2, 1988, abandoned, and a continuation-in-part of Ser. No. 347,602, May 3, 1989, which is a continuation-in-part of Ser. No. 346,771, May 2, 1989, abandoned. This application Jul. 5, 1990, Ser. No. 549,298

Int. Cl.[5] B41J *3/38, 29/02;* B65D *85/28*

U.S. Cl. 400—88 **69 Claims**

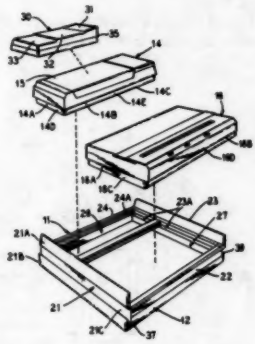
1. In a modular printer system,

a modular printer device for containing a computerized terminal for supplying data to be printed and a printer means for printing data supplied by a computerized terminal, said modular printer device comprising an open frame having first terminal module receptacle means and having second printer module receptacle means,

a terminal module for releasably receiving a computerized terminal, said terminal module with a received computerized terminal being supported in said first terminal module receptacle means such that data may be supplied from a received computerized terminal to a printer means contained by said modular printer device, and being supported in said second printer module receptacle means,

a printer module for receiving a printer means such that data may be supplied to a received printer means from a computerized terminal in said terminal module, and

a printer unit in said printer module having a paper feed direction, and the printer unit being reversible with the printer module so as to provide a first paper feed direction in the first orientation of the printer module and so as to provide an opposite paper feed direction opposite to said



first paper feed direction in the reverse orientation of the printer module.

5,180,233

THERMAL TRANSFER PRINTER

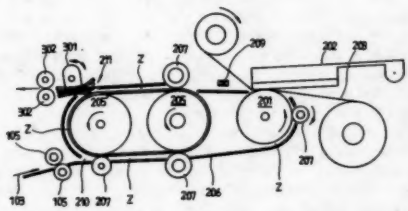
Jong-woo Kim, and Ki-sun Jang, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 7, 1991, Ser. No. 711,979

Claims priority, application Rep. of Korea, Jan. 31, 1991, 91-1868

Int. Cl.[5] B41J *2/32*

U.S. Cl. 400—120 **9 Claims**



1. A thermal transfer printer comprising:

a paper supply section including a plurality of roller guides for guiding a paper from a paper tray;

a thermal print head;

a printing section including a platen drum for supporting said paper while printing of a color picture is performed by said thermal print head, said thermal print head being pressed against said platen drum, an endless conveying belt spaced-apart from said platen drum, two or more paper guiding drums being connected together by said endless conveying belt, said guiding drums rotating said endless conveying belt independently of said platen drum, and being spaced-apart and arranged in parallel to said platen drum, said two or more paper guiding drums and said platen drum forming a closed loop for guiding said paper along the periphery of said closed loop, and a plurality of roller guides, provided in complement to said paper guiding drums for guiding movement of said paper through said closed loop; and

a paper discharging section including a plurality of roller guides for discharging said printed sheets of paper.

5,180,234

DOT MATRIX PRINTING HEAD FOR HIGH-DEFINITION OR HIGH-SPEED PRINTING

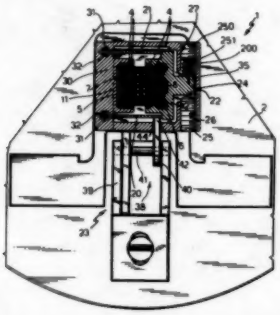
Carlo Motta, Borgofranco D'Ivrea, Italy, assignor to Microlys S.p.A., Ivrea, Italy

Filed Oct. 31, 1991, Ser. No. 785,456

Claims priority, application Italy, Oct. 31, 1990, 67859 A/90

Int. Cl.[5] B41J *2/25*

U.S. Cl. 400—124 **8 Claims**



1. A dot matrix printing head comprising a printing body, a plurality of needles slidable axially in the printing body, first and second matrix elements, respective tips of the needles being guided in two parallel rows by the first and second matrix elements (**7, 8**) which are disposed side by side, said first matrix element being carried by a first fixed support (**11**) fixed to the printing body and said second matrix element being carried by a second movable support (**12**) carried by the printing body and arranged to move the second matrix element parallel to the first matrix element to locate it selectively in a first position, in which the tips of the needles in the two rows are at the same heights for effecting high-speed printing, and in a second position, in which the tips of the needles in one row are disposed at the heights of the spaces between the tips of the needles in the other row in order to effect high-definintion printing, a parallelogram structure, a resilient means (**200**), a first abutment and a second abutment each provided on and fixed to the printing body, the second movable support (**12**) being connected to the printing body (**2**) by said parallelogram structure in which two parallel sides are constituted by the second movable support and by the printing body and other two sides are constituted by respective articulation members which are acted upon respectively by the resilient means (**200**) which is pre-loaded so as to hold the second movable support normally against the first abutment (**22**) of the printing body, and an electromagnetic actuator (**23**) provided separately from said parallelogram structure and being adapted to displace the second movable support selectively against the action of the resilient means into contact with the second abutment (**24**) of the printing body, said second abutment being opposed to and facing said first abutment.

5,180,235

IMPACT PRINTER WITH VARIABLE IMPACT AND REBOUND CONTROL

Tetsuya Saito, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 553,367, Jul. 17, 1990, abandoned, which is a continuation of Ser. No. 241,862, Sep. 8, 1988, abandoned. This application Jun. 2, 1992, Ser. No. 892,473

Claims priority, application Japan, Sep. 22, 1987, 62-239469

Int. Cl.[5] B41J *9/42, 9/48*

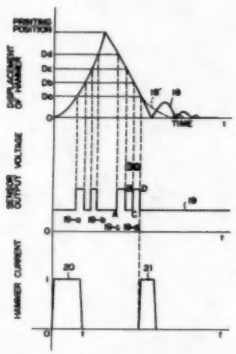
U.S. Cl. 400—167 **21 Claims**

1. A recording apparatus for recording on a recording medium, said apparatus comprising:

an image holding member;

impacting means for impacting said image holding member to record on the recording medium, said impacting means being movable between an impacting position and a standby position;

driving means for driving said impacting means from said standby position to said impacting position, said driving means applying first and second drive forces for driving said impacting means to said impacting position and a third drive force applied between said first and second drive forces;



discriminating means for discriminating whether said third drive force is applied to said impacting means as said impacting means returns from said impacting position to said standby position; and

controlling means for controlling said drive means, wherein when said discriminating means discriminates that said third drive force is not applied to said impacting means, said control means controls said drive means to apply a second drive which is smaller than said first drive force.

5,180,236

TRANSFER PRINTER

Satoshi Kitahara, Mishima; Shuji Koyama, Ito, and Tsugio Shiozaki, Susono, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1991, Ser. No. 728,238

Claims priority, application Japan, Jul. 13, 1990, 2-186884; Jul. 13, 1990, 2-186886

Int. Cl.[5] B41J *1/56*

U.S. Cl. 400—175 **6 Claims**

1. A transfer printer comprising:

a main body including first and second supporting sections facing each other;

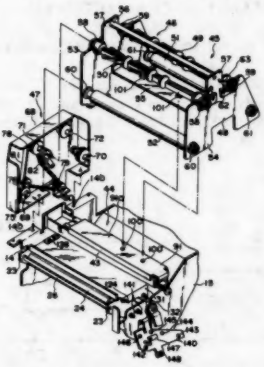
a platen extending between the first and second supporting sections;

a head unit including a print head;

a supporting member having a fixed end fixed to the first supporting section and a free end extending close to the second supporting section, said supporting member supporting the head unit in an operative position in which the print head is opposed to the platen so that the head unit is movable along the supporting member in a longitudinal direction of the platen, from the operative position to the outside of the main body;

fixing means attached to the second supporting section so as to be movable between a release position in which the head unit is allowed to move and a hold position in which

the fixing means engages and supports the free end of the supporting member; and



means for holding the head unit, supported by the supporting member, in the operative position.

5,180,237

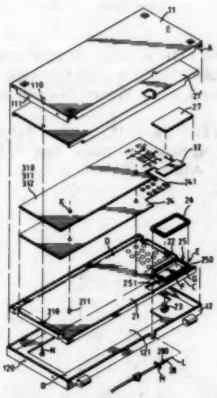
KEYBOARD FOR UNDER WATER USE

Yen-Chin Chen, Hsinchu, Taiwan, assignor to Getac Corporation, Hsinchu, Taiwan

Filed Jun. 23, 1992, Ser. No. 902,711

Int. Cl.[5] B41J *5/16*

U.S. Cl. 400—479 **2 Claims**



1. A keyboard for use under water, comprising:

a casing composed of a lower half with a bottom and an upper half including a lid with an opening;

a key plate having an upper face and a lower face provided on said bottom of said lower half and having a plurality of actuator keys formed on said upper face thereof and protruding from said opening of said lid;

means for normally retaining said plurality of actuator keys in an unpressed position;

a switch contact assembly provided on said lower face of said key plate, said switch contact assembly including a first membrane layer having a first conductive pattern, a second membrane layer having a second conductive pattern and a partition membrane disposed between said first and second membrane layers for separating said first conductive pattern from said second conductive pattern in a normally open switch, said partition membrane having a hole means which permits a portion of said first conductive pattern to engage with a portion of said second pattern when said first membrane layer is pressed by one of said actuator keys so as to generate a signal corresponding to said actuator key, the periphery of said first membrane layer being adhesively connected to a face of said partition membrane and the periphery of said second membrane layer being adhesively connected to another face of said partition membrane, said key plate further including a water tight compartment formed on said lower face thereof and having a circuit board therein;

said water tight compartment further including an opening;

a cable means having one end connected to said conductive patterns of said adhesively bonded membrane layers and another end of which extends through said opening to connect with said-circuit board; and

a sealing member provided around said opening of said water tight compartment to prevent water from seeping therein.

5,180,238

DOT IMPACT PRINTER

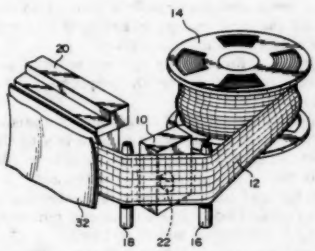
Hiromi Hibino; Kazumi Hasegawa, both of Tokyo; Koujiro Nishida, Coburg; Kouzou Abe, Tokyo, and Toshio Kurihara, Tokorozawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1991, Ser. No. 710,277

Claims priority, application Japan, Jun. 14, 1990, 2-157093

Int. Cl.[5] B41J *33/36*

U.S. Cl. 400—247 **2 Claims**



1. A dot impact printer of a type including an inked ribbon, said printer comprising:

a printing means for impacting printing pins perpendicularly on a widthwise central portion of said inked ribbon to form a pattern of dots on a sheet of paper; said impacting eventually resulting in said widthwise central portion being crushed and slackened,

a ribbon feeder for continuously feeding said inked ribbon to said printing means;

means for detecting the slackening of said width wise central portion including guide elements providing a straight path for said ribbon between said guide elements;

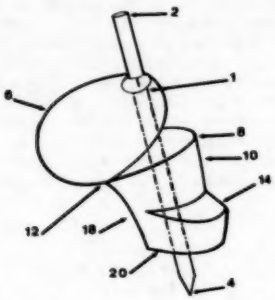
a sensor located between said guide elements for contacting and detecting slackening of only the widthwise central portion of said inked ribbon which has been crushed by impact of said printing pins upon said ribbon and means for generating an alarm signal responsive to an amount of slack in said widthwise central portion which exceeds a predetermined amount, said sensor having a contact member being biased to be perpendicular against a surface of said inked ribbon and in contact with only the widthwise central portion of said inked ribbon; and

a control means for sending a control signal to said printing means nd said ribbon feeder in response to said alarm signal from said sensor to interrupt printing and feeding operations.

5,180,239
ADAPTABLE PRESSURE WRITING INSTRUMENT HOLDER

Carl Bistrack, 295 Gypsy La., King of Prussia, Pa. 19406

Filed Feb. 7, 1991, Ser. No. 652,067
Int. Cl.[5] B43K *23/00*
U.S. Cl. 401—6 6 Claims



1. A hand-held adaptable pressure writing instrument holder especially adapted for use by person with manual or digital impairments, comprising:

a one-piece body shaped to conform to the curvatures of various parts of the hand and the natural tendencies of the fingers of the hand and containing a plurality of integrated control surfaces;

said body being of a size capable of fitting into the palm of the hand and large enough to enable all of the fingers of the hand to placed upon said body;

said body being formed of a resilient material so as to be adaptable to conform to the application of pressure thereto;

said body having a central through-bore of a predetermined diameter enabling adaptation to a variety of shapes and instruments capable of being inserted into said bore;

said body having a top end and a bottom end;

said bore having a first end terminating in the opening at the top end of said body and second end terminating in an opening in the bottom end of said body;

said top end comprising a substantially egg-shaped palm rest;

said bottom end having a curved convex surface surrounding said bottom opening and curving upwardly generally in the direction toward said top end;

a lower finger shelf comprising a lower finger shelf surface located a predetermined distance above said bottom end opening and partially encircling said bore;

the outer periphery of said lower finger shelf surface being joined to the upwardly curve portion of said bottom end;

an intermediate body portion extending between said top and bottom ends having a lower rearward portion curving upwardly and outwardly from said bottom end toward said palm rest;

an upper finger shelf positioned between said top end and said lower finger shelf and comprising an upper finger shelf surface partially encircling said bore;

said upper finger shelf extending in an outward direction and merging with a top forward portion of said intermediate body portion;

an inner end of the upper finger shelf curving upwardly toward said palm rest;

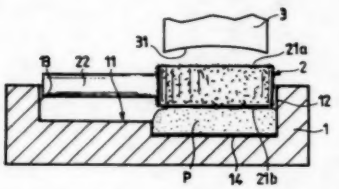
said lower and upper finger shelves having curved forward peripheral portions which partially encircle said bore and extending generally in the direction of a forward side of said body;

said intermediate body portion having a forward side extending between said upper and lower finger shelves along the forward side of said body.

5,180,240
PROCESS FOR COMPACTING A PULVERULENT MIXTURE ON A SUPPORT AND MAKE-UP APPLICATOR FORMED BY A SUPPORT PROVIDED WITH A PELLET OF COMPACTED PULVERULENT MIXTURE

Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Apr. 22, 1992, Ser. No. 872,042
Claims priority, application France, Apr. 29, 1991, 91 05244
Int. Cl.[5] A45D *33/38, 40/20;* B65B *1/22;* B30B *11/04*
U.S. Cl. 401—88 13 Claims

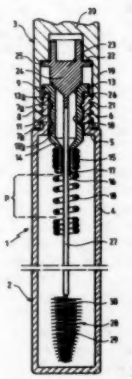


1. Process for compacting a pulverulent mixture (P) on a support (2), in which a layer of pulverulent mixture to be compacted is deposited at the bottom of an enclosure (11), a piston (3) slides in the enclosure, pressure is applied to the mixture to be compacted with the aid of a piston sliding in this enclosure and, simultaneously, ultrasonic waves are applied to the said mixture, characterised in that a support (2) is placed on the layer of pulverulent material to be compacted, at least the surface (21*b*) of said support in contact with the pulverulent mixture displaying anfractuosities, and that the pressure and ultrasonic waves are applied to the pulverulent mixture through the support (2).

5,180,241
APPLICATOR FOR A THIXOTROPIC PRODUCT, ESPECIALLY A MASCARA

Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Oct. 24, 1991, Ser. No. 781,909
Claims priority, application France, Nov. 8, 1990, 90 13850
Int. Cl.[5] A46B *11/00;* A45D *40/00, 40/26*
U.S. Cl. 401—122 17 Claims



1. Device for the application of a thixotropic product with the aid of a brush, especially a mascara for the eyelashes, comprising a container (2, 102) for the said thixotropic product, a movable cap (3, 103) joined to the container (2, 02), a rod

(27, 127) integral with the cap (3, 103), disposed substantially along the axis thereof and projecting with respect to the said cap (3, 103), and a brush (28, 128) comprising bristles carried by the end of the rod (27, 127) opposite the cap (3, 103) as an extension of the said rod (27, 127), the brush (28, 128) penetrating into the interior of the container (2, 102) via a wiping zone, characterised in that a winding (18, 118) is disposed in the interior of the said container (2, 102), at least a main part (P) of which comprises a plurality of non-contiguous turns, the axis of the said part (P) of the winding substantially coinciding with the axis of the wiping zone, the non-contiguous turns of the said part (P) of the winding internally defining a cylindrical space, the section of which is homothetic with respect to the largest section of the brush (28, 128) in a homothetic ratio of less than 1, but sufficient to allow for the passage of the said brush through the part (P) of the winding (18, 118).

5,180,242

ROLL-ON APPLICATION WITH FRANGIBLE CAP

Vincent De Laforcade, Clamart, France, assignor to L'Oreal, Paris, France

Filed Apr. 24, 1991, Ser. No. 690,264

Claims priority, application France, May 10, 1990, 90 05803

Int. Cl.[5] A45D *34/04*

U.S. Cl. 401—132 **3 Claims**

1. A single use roll-on applicator for a liquid or pasty cosmetic or pharmaceutical product comprising a tubular body having a closed end and an applicator end, said applicator end having an interior surface engaging a portion of a spherical ball, said interior surface having an inner edge and an outer portion, said interior surface being curved to complement the surface of said ball engaged therewith, said interior surface having a movable rib located at said inner edge of said interior surface to allow insertion of said ball, said outer portion being substantially cylindrical and having an external surface defining an integrally formed cap for said applicator, said external surface including a peripheral line of reduced thickness for facilitating separation of said cap from said tubular body, said curved interior surface being dimensioned to allow said ball to project beyond said peripheral line, said cap including a small rectangular bar extending outwardly of said tubular body.

5,180,243

APPARATUS FOR CLEANING SENSITIVE SURFACES, IN PARTICULAR OPTICAL GLASSES

Walter Vick, Hermann Löns Str. 15, D-2902 Rastede, Fed. Rep. of Germany

PCT No. PCT/EP88/00524, § 371 Date Feb. 17, 1989, § 102(e) Date Feb. 17, 1989, PCT Pub. No. WO88/10443, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 14, 1988, Ser. No. 334,104

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1987, 3720502

Int. Cl.[5] G02C *13/00*

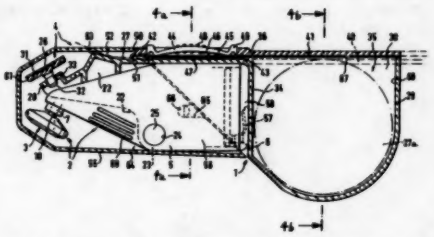
U.S. Cl. 401—195 **31 Claims**

1. An apparatus for cleaning the surfaces of optical glasses comprising:

a longitudinally extending handle having a first and second end;

wetting and wiping means for the surfaces of the optical glasses for loosening and detaching the impurities; and

cleaning means for absorbing the impurities from the surfaces of the optical glasses, wherein said wetting and



wiping means and said cleaning means are both located at said first end of said handle on opposite sides of a longitudinal axis of said handle, generally facing away from the longitudinal axis.

5,180,244

VISCOUS LIQUID APPLICATOR

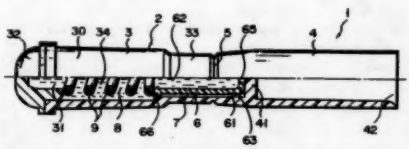
Kazunori Hirose, Yamanashi, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1991, Ser. No. 757,895

Claims priority, application Japan, Sep. 14, 1990, 2-244267

Int. Cl.[5] A45D *34/00*

U.S. Cl. 401—264 **9 Claims**



1. A viscous liquid applicator comprising:

a cylindrical container having a closed bottom, said cylindrical container comprising an applying material-filling portion and a coater-supporting portion formed integral with a distal end portion of said applying material-filling portion;

a viscous liquid applying material filled in said applying material-filling portion; and

a cylindrical applying member having a barrier wall formed at and traversing a distal end portion thereof, and at least one through hole formed in said barrier wall for introducing air into said applying material-filling portion, said cylindrical applying member being slideably mounted in said coater-supporting portion so as to be reciprocally movable into and out of said cylindrical container, said cylindrical applying member being dimensioned relative to said coater-supporting portion so as to form a space between an outer wall of said cylindrical applying member and an inner wall of said coater-supporting portion for allowing said viscous liquid applying material to be extruded out of said applying material-filling portion, through said space, and to be coated on said outer wall of said cylindrical applying member when said cylindrical applying member is pushed into said applying material-filling portion to increase pressure in said applying material-filling portion to force said applying material out through said space.

5,180,245

LIQUID CONTAINER WITH SPECIFIC VALVE

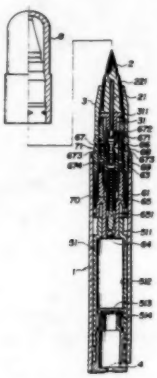
Shigeo Iizuka, Funabashi, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 651,010, Feb. 5, 1991, abandoned, which is a division of Ser. No. 400,884, Aug. 30, 1989, Pat. No. 5,007,757. This application Nov. 18, 1991, Ser. No. 794,666

Claims priority, application Japan, Jun. 2, 1988, 63-115833; Sep. 8, 1988, 63-118257

Int. Cl.[5] A46B *11/02*

U.S. Cl. 401—278 **6 Claims**



1. A liquid container comprising:

a shaft;

a fixed cylinder provided on an upper end of the shaft;

a liquid supply means provided on an upper end of said fixed cylinder;

a liquid receiving means provided in the shaft and slidably with respect to the shaft;

a movable cylinder including a suction valve, said movable cylinder being fitted in an upper end of the liquid receiving means and being slidable with respect to said fixed cylinder, said liquid supply means, said fixed cylinder, said movable cylinder and said liquid receiving means defining a passage for the liquid;

springs for biasing the movable cylinder with respect to the fixed cylinder;

a push button provided at a lower end of the shaft for sliding said liquid receiving means; and

a discharge valve located within said fixed cylinder and coupled for selective fluid communication between said liquid supply means and said liquid receiving means, said discharge valve comprising

a discharge port forming cylindrical member having a discharge port therein fitted and secured in said fixed cylinder,

a valve body movably seated in a valve seat in said passage for selectively opening and closing said passage, and

resilient spaced valve stems formed between said discharge port forming cylindrical member and said valve body,

intermediate portions of the resilient valve stems being curved inwardly toward each other.

5,180,246

BINDING SYSTEM

Greg A. Hightower, P.O. Box 369, Wayne, Ill. 60184

Filed May 16, 1991, Ser. No. 701,203

Int. Cl.[5] B42F *3/02*

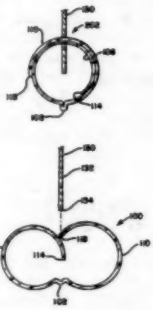
U.S. Cl. 402—20 **14 Claims**

1. A one piece plastic binder having a generally circular cross section when in a closed position comprising:

a. an elongated section with a living hinge having two hinge extensions;

b. a first plurality of spaced apart ribs, the ribs having a distal end and a proximal end with the proximal end integrally formed onto one hinge extension; and

c. a second plurality of spaced apart ribs, the ribs having a distal end and a proximal end with the proximal end integrally formed onto the other hinge extension, the second plurality or ribs being opposite to and corresponding in location with the first plurality of ribs, the second plurality of ribs further having a length such that when the binder is in a closed position, the second plurality of ribs substantially overlap the first plurality of ribs and when the binder is in an open position, the distal end of the second plurality of ribs contacts the first plurality of ribs.



5,180,247

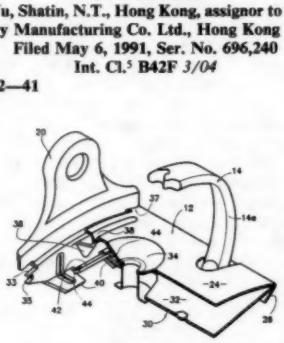
RING BINDER

Cheng H. Yu, Shatin, N.T., Hong Kong, assignor to World-Wide Stationery Manufacturing Co. Ltd., Hong Kong

Filed May 6, 1991, Ser. No. 696,240

Int. Cl.[5] B42F *3/04*

U.S. Cl. 402—41 **37 Claims**



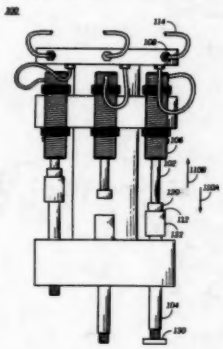
1. A ring binder including a base member supporting a plurality of ring members, and an opening mechanism at each end of the base member for opening the plurality of ring members, each opening mechanism including lock means to lock the opening mechanisms in their closed position, the base member comprising a rigid upper structure supporting a pivotable lower structure to which the ring members are mounted, wherein at each end of the binder, the opening mechanism is pivotally supported by and between the lower structure and the upper structure, externally of the lower structure, and internally of the upper structure, and wherein a base of the opening mechanism acts on the underneath of the pivotable lower structure to force this lower structure to move upwards and pivot.

5,180,248

METHOD AND APPARATUS FOR CORRECTING MISALIGNMENTS IN COUPLINGS

Andrew Marozsan, and Daniel Peana, both of Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 5, 1991, Ser. No. 740,162
Int. Cl.[5] B25G 3/00
U.S. Cl. 403—13 5 Claims



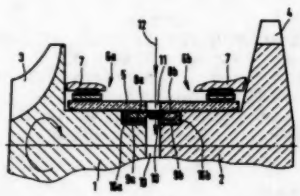
1. An apparatus in a robotic assembling device, comprising:
a first shaft having a ferrous material affixed thereto; and
a second shaft having a magnetic material affixed thereto, the magnetic material providing an alignable magnetic coupling with the ferrous material of the first shaft for correcting misalignment therebetween when a rotational motion is provided along the vertical axis of the first and second shafts for rotating the first and second shafts, a force being exerted by the rotational motion moves the second shaft with respect to the first shaft which corrects misalignment in the alignable magnetic coupling.

5,180,249

THERMALLY STRESSED, TORSIONALLY RIGID CONNECTION

Hagen Hanser, München, and Hubert Grieb, Germering, both of Fed. Rep. of Germany, assignors to MTU Motoren-Undturbinen-Union Munchen GmbH, Fed. Rep. of Germany

Filed Apr. 11, 1991, Ser. No. 683,815
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1990, 4012211
Int. Cl.[5] F16C 9/00
U.S. Cl. 403—28 18 Claims



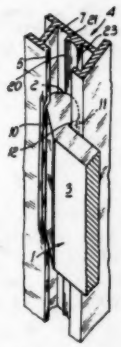
1. A thermally and mechanically stressed, torsional rigid connection between two coaxially aligned shafts, comprising:
a first shaft shoulder formed on an end of one of said two coaxially aligned shafts,
a second shaft shoulder formed on an end of the other of said two coaxially aligned shafts, said first and second shaft shoulders being situated opposite one another;
first and second elastic intermediate layers formed on said first and second shaft shoulders, respectively;
two metallic coupling sleeves engaging one another, one of said two metallic coupling sleeves being fastened to said one coaxially aligned shaft through said first intermediate layer and the other metallic coupling sleeve being fastened to said other coaxially aligned shaft through said second intermediate layer; and
a ceramic centering sleeve surrounding said two metallic coupling sleeves and shrunk onto said two coaxially aligned shafts.

5,180,250

SELF-LOCKING COUPLING STRUCTURE FOR CONNECTING ACCESSORIES TO PROFILED ELEMENTS

Nicoló Ferro, Trieste, Italy, assignor to Alprogetti S.r.l., Monza, Italy

Filed Jul. 30, 1990, Ser. No. 559,797
Claims priority, application Italy, Aug. 8, 1989, 21475 A/89; Aug. 8, 1989, 21477 A/89
Int. Cl.[5] F16B 5/07
U.S. Cl. 403—252 9 Claims



1. In combination, a profiled element and a self-locking coupling element, said profiled element having a longitudinal extension, said profiled element comprising a seat defined therein which extends in the direction of said longitudinal extension, said seat being delimited by a bottom and by a pair of opposite wings of said profiled element, an opening being defined between said pair of opposite wings which substantially extends in the direction of said longitudinal extension and which opens into said seat, said bottom being arranged opposite to said opening, said self-locking coupling element comprising a substantially convex semicylindrical protrusion which is inserted through said opening and accommodated in said seat of said profiled element, said self-locking coupling element further comprising an engagement portion which extends from said semicylindrical protrusion inside said seat through said opening outside of said seat, said engagement portion being in locked engagement with a locally deformed portion of one of said pair of opposite wings, said locally deformed portion of said one of said pair of opposite wings substantially extending in the direction of said longitudonal extension and being deformed with respect to the remaining portion of said one of said pair of opposite wings in a direction away from said bottom of said seat, said bottom of said seat comprising at least one coupling region which defines a first abutment edge and a second abutment edge which both extend substantially in the direction of said longitudinal extension, said first abutment edge being arranged near said one of said pair of opposite wings and said second abutment edge being arranged nearer the other of said pair of opposite wings, said semicylindrical protrusion being in locked engagement with both of said first abutment edge and said second abutment edge, said self-

locking coupling element further comprising a stop portion which extends inside said seat substantially in the direction of said longitudinal extension and which lockingly engages inside said seat with the other of said pair of opposite wings of said profiled element.

5,180,251

UNDERGROUND PROTECTION UNDERNEATH A DUMP

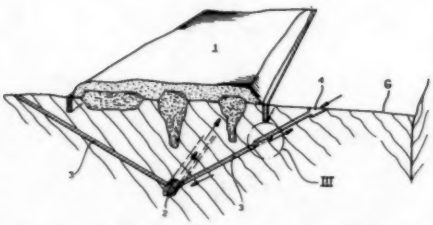
Friedrich W. Paurat, Kasselweg 29, D-4230 Wesel 1, and Roland Paurat, Blumenstrasse 11, D-4230 Wesel 13 both of Fed. Rep. of Germany

Filed Jun. 11, 1991, Ser. No. 714,250

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1990, 4018822; Jun. 12, 1990, 4018824

Int. Cl.[5] B09B *1/00*

U.S. Cl. 405—129 **15 Claims**



1. A method of isolating a dump sitting on the ground, the method comprising the steps of:

driving a tunnel longitudinally through the ground underneath the dump;

cutting from at least one side of the tunnel with a longwall-mining machine a longitudinally and transversely extending slit having a lower end opening into the tunnel and an upper end opening at ground level;

providing a liquid barrier in the slit underneath the dump;

conveying the material dug by the machine to form the slit downward along the slit into the tunnel and thence along and out of the tunnel; and

bringing stowing material into the slit from the upper end thereof and backfilling behind the machine with the stowing material.

9. An apparatus for isolating a dump sitting on the ground, the apparatus comprising:

means for driving a tunnel longitudinally through the ground underneath the dump;

means for cutting from at least one side of the tunnel with a longwall-mining machine a longitudinally and transversely extending slit having a lower end opening into the tunnel and an upper end opening at ground level;

means for providing a liquid barrier in the slit underneath the dump;

means for conveying the material dug by the machine to form the slit downward along the slit into the tunnel and thence along and out of the tunnel; and

means for bringing stowing material into the slit from the upper end thereof and backfilling behind the machine with the stowing material.

5,180,252

EARTH PRESSURE SYSTEM SHIELD PROCESS

Hiroshi Tanaka, and Ryoji Kobayashi, both of Osaka, Japan, assignors to Kabushiki Kaisha Konoike Gumi, Osaka and Kabushiki Kaisha Komatsu Seisakusho, Tokyo, both of, Japan

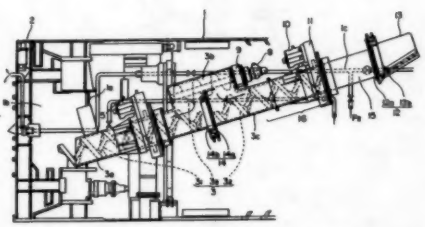
PCT No. PCT/JP90/00539, § 371 Date Oct. 4, 1991, § 102(e) Date Oct. 4, 1991, PCT Pub. No. WO90/13733, PCT Pub. Date Nov. 15, 1990

PCT Filed Apr. 25, 1990, Ser. No. 768,981

Claims priority, application Japan, Apr. 28, 1989, 1-107401; Apr. 28, 1989, 1-107402

Int. Cl.[5] E21D *9/08*

U.S. Cl. 405—144 **4 Claims**



1. In an underground tunneling process, which comprises excavating underground soil from the working face of an underground tunnel excavation, discharging a mud comprised of excavated soil and water into a mixing chamber and then feeding the mud through a soil discharge screw conveyor to a location spaced from said working face and said mixing chamber, the improvement which comprises;

feeding into the region of said working face an excavation additive comprising (1) an agent for improving the fluidity and viscosity of the excavated soil and (2) a mud-improving main agent effective to coagulate the soil, said mud-improving main agent that is fed into said region being coated with a water-insoluble coating so that it is not effective to coagulate the soil in said region, said excavation additive being uniformly dispersed in said mud in said region, in said mixing chamber and in said soil discharge screw conveyor to form a mud having high fluidity and viscosity; then adding to and mixing with the mud that is being moved through said soil discharge screw conveyor (3) a mud-improving assistant agent effective to chemically remove the water-insoluble coating on said mud-improving main agent whereby said mud-improving main agent then becomes effective to coagulate the excavated soil to convert same into a high quality, coagulated soil.

5,180,253

ARRANGEMENT OF PRESTRESSING TENDONS IN A PRESSURE TUNNEL

Erwin Siegfried, Primelweg 8, 3097 Liebefeld, and Peter Marti, Riedlistrasse 56, 3123 Belp, both of Switzerland

Filed Aug. 13, 1991, Ser. No. 744,325

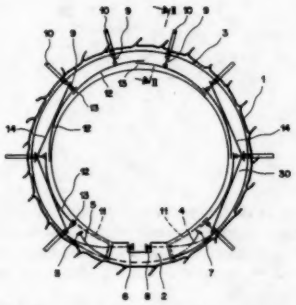
Claims priority, application Switzerland, Aug. 24, 1990, 2751/90

Int. Cl.[5] E21D *11/00*

U.S. Cl. 405—146 **10 Claims**

1. An arrangement of prestressing tendons in a pressure tunnel having a prestressed concrete lining, wherein each of the prestressing tendons comprises a bundle of monostrands, said bundle being held together at approximately regular intervals, and each of the prestressing tendons running essentially parallel to each other and along the circumference of the pressure tunnel opening which is above the earth's surface and being fixed to fixing devices along the prestressing tendon and anchored in the earth, wherein there are means along each of the prestressing tendons for keeping each monostrand of the

corresponding bundle at a first distance from the adjacent monostrands, wherein the fixing devices are prestressing tendon supports directed essentially towards the longitudinal axis of the pressure tunnel, disposed along the circumference and along the longitudinal axis of the pressure tunnel, and wherein several of the prestressing tendons are fixed to each of the prestressing tendon supports, there being a second distance



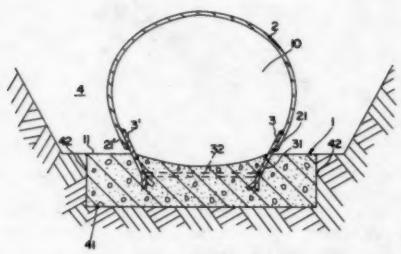
between the individual prestressing tendons in both the direction of the longitudinal axis of the pressure tunnel as well as in prestressing tendons adjacent to each other in the radial direction, and wherein the second distance at which the individual prestressing tendons are distanced from one another, is greater than the first distance at which the individual monostrands are distanced from each other within a prestressing tendon.

5,180,254

FLUID-CONVEYING CONDUIT

Marcel Matiere, 17 Avenue Aristide Briand, 15000 Aurillac, France

Continuation of Ser. No. 507,232, Apr. 10, 1990, Pat. No. 5,061,121. This application Oct. 7, 1991, Ser. No. 772,242
Claims priority, application France, Apr. 10, 1989, 89 04692
Int. Cl.[5] F16L *1/028, 9/22*
U.S. Cl. 405—155 **22 Claims**



1. A conduit for large section intended to be laid on a ground surface for conveying a fluid under high pressure, said conduit being formed by assembling longitudinal sheet metal plates delimiting an elongated tubular space which is tightly closed and adapted to resist an internal pressure in excess of 10 bars, said tubular space having a truncated circular cross-section, said conduit comprising

(a) a lower flat base constituted by a reinforced concrete slab resting on said ground surface, a thickness and reinforcement of said slab being determined as a function of forces applied depending on pressure and dimensions of said conduit;

(b) an upper part forming a vault covering a circular sector between two lateral edges and constituted by assembled incurved metal plates;

(c) two longitudinal joining members respectively for tightly joining each of said lateral edges of said vault to said lower flat base;

(d) each of said joining members being constituted by a profiled metallic plate having an upper part and a lower part;

(e) said upper part of each of said joining members being so oriented as to form a springing line of said vault and being welded along a corresponding said lateral edge of said vault;

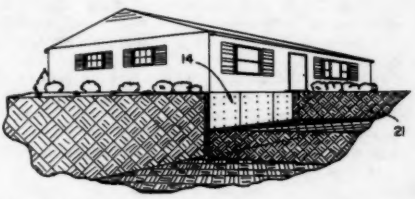
(f) sealing means and fixing means between said lower part of each of said joining members and said lower flat base, said sealing and fixing means being adapted to withstand stresses applied as a function of internal pressure in the dimensions of said conduit.

5,180,255

MOISTURE-IMPERVIOUS PANEL CAPABLE OF DELAYED HYDRATION

William Alexander, Naperville, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Division of Ser. No. 481,454, Feb. 15, 1990, Pat. No. 5,053,265. This application May 29, 1991, Ser. No. 706,642
Int. Cl.[5] E02D *31/02*
U.S. Cl. 405—270 **10 Claims**



1. A method of preventing water from contacting a structure comprising installing a multi-layer article of manufacture against said structure;

said multi-layer article including first and second sheet material layers having a layer of water-swellable clay therebetween, such that said first sheet material layer is disposed against the structure and the second sheet material layer is water penetratable and includes inner and outer surfaces, said outer surface facing outwardly from said structure, said outer surface including a water-soluble coating layer of material removable by water contact; and

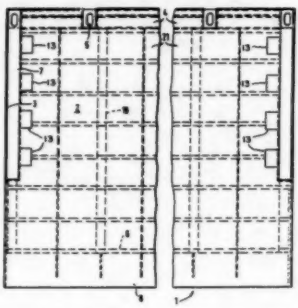
disposing an overlayer of material against said coating layer of said article during installation to sandwich the multi-layer article between said structure and the overlayer of material, such that water-penetrating said overlayer of material will remove the coating layer to thereafter permit water to penetrate the second sheet material layer and contact the water-swellable clay causing the clay to hydrate and prevent substantial water contact with the structure, said coating layer requiring about 0.1 to about 6.1 weeks in contact with water for complete removal from the exterior of the second sheet material layer.

5,180,256

SUPPORT DEVICE FOR LINING A DITCH

Josef Krings, Heinsberg, Fed. Rep. of Germany, assignor to Teska Verbautechnik GmbH, Oberhausen, Fed. Rep. of Germany

Filed Feb. 28, 1992, Ser. No. 846,262
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1991, 4106698; Apr. 8, 1991, 4111266
Int. Cl.[5] E02D *17/08*
U.S. Cl. 405—282 5 Claims



1. A support device for lining a ditch, said device supported by braces, comprising:

an inner plate;

an outer plate parallel to and facing said inner plate;

a frame having an upper cross bar, a lower cross bar and side bars placed between and in contact with said plates at their periphery, said side bars including brace connection means for releasably engaging the braces;

longitudinally extending trapezoidal-shaped webs on each plate, said webs each having two sides and a top which is parallel to each plate, the distance between adjacent webs along each plate is approximately equal to the width of said top, said webs on said inner plate being offset from said webs on said outer plate so that said webs on said plates matingly interconnect, whereby said tops are in contact with the facing sheet plate, and said sides of adjacent webs are parallel and in contact with each other;

reinforcement pipes extending from said upper cross bar, through said sides of said webs to said lower cross bar in a direction perpendicular to the longitudinal direction of said webs.

5,180,257

STRAIGHTENING INSTRUMENT AND CYCLONE

Ryousuke Narishima; Tetsuo Ogiri; Youji Kawamura, and Hiroaki Iwakawa, all of Tokyo, Japan, assignors to Onoda Cement Co. Ltd., Onoda, Japan

Filed Dec. 14, 1990, Ser. No. 627,462
Claims priority, application Japan, Dec. 16, 1989, 1-326996; Mar. 19, 1990, 2-69055
Int. Cl.[5] B65G *53/60*
U.S. Cl. 406—173 7 Claims

4. A cyclone comprising:

a swirl cylinder having a center axis, inner and outer peripheries, and upper and lower sections;

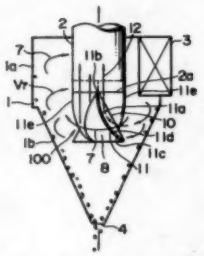
an inner tube disposed in the upper section of said swirl cylinder;

an inlet duct arranged tangentially to the outer periphery of said swirl cylinder;

a drop opening formed in the lower section of said swirl cylinder;

a conical member arranged coaxially with said inner cylinder and having a center axis and an outer peripheral surface formed therein with a conical surface; and

a plurality of reversed triangular shaped rectifying plates each having at least a lower half section formed as a curved surface and linear in shape when viewed in horizontal crosssection, said rectifying plates being arranged around said axis of said conical member at equal angular



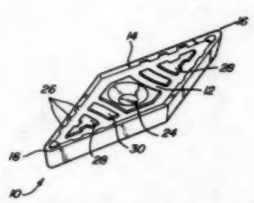
intervals in directions in which said curved surfaces of said shaped rectifying plates extend downward to encounter a fluid stream swirling around the outer periphery of said conical member and direct the movement of said stream upward.

5,180,258

HIGH FEED HEAVY DEPTH OF CUT INSERT FOR THE ALUMINUM WHEEL TURNING MARKET

Thomas J. Bernadic, Madison Heights, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Sep. 30, 1991, Ser. No. 767,182
Int. Cl.[5] B23B *27/22*
U.S. Cl. 407—114 3 Claims



1. An indexable polygonal insert for high feed and heavy depth of cut, comprising:

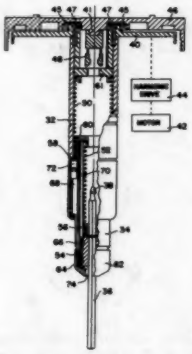
an upper surface, a lower surface adapted to be seated in a tool holder, and a side flank surface extending substantially unbroken therebetween to define the insert body, said upper surface having a cutting edge extending along the perimeter of the insert, a land surface rearward to the cutting edge and descending therefrom, a chipgroove surface rearward from said land and of lower elevation than said cutting edge, said upper surface further provided with an aperture extending at least partially through the insert, and chipbreaker islands to deform chips during cutting operations, said land further provided with a plurality of notches along the flank of the insert to aid in bending of removed material and distribute pressure on the cutting edge by decreasing friction to add stress/strain to the material to break the material into small chips, said insert further provided with at least one nose portion created by the intersection of the chip groove, land and cutting edges.

5,180,259

RETRACTABLE TOOL BIT HAVING LATCH TYPE CATCH MECHANISM

George Voellmer, Takoma Park, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 22, 1991, Ser. No. 796,496
Int. Cl.[5] B23B *31/10*
U.S. Cl. 408—124 **16 Claims**



1. A retractable tool bit assembly comprising:

at least one rotatable outwardly protruding tool bit holder section;

an elongated spring biased tool mounted for axial movement in and out of said holder section and having an inwardly retracted parked position and an outwardly extended use position, said tool further including an inner end having a grippable tool head thereat;

a hook type catch mechanism located adjacent the holder section and including means for engaging said tool head when said tool is moved to said parked position,

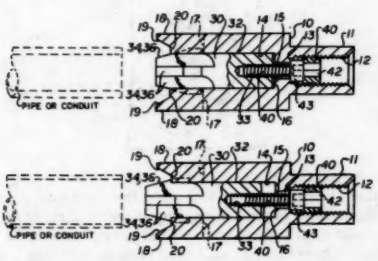
said tool further having an eccentric ovular neck portion adjacent the tool head for releasing the tool head from the catch mechanism when said tool is rotated, whereupon said spring biased tool extends fully outward to said use position.

5,180,260

CHAMFERING REAMER WITH TRIP SHOULDER

Douglas B. Phillips, Sr., 4124 Greenleaf, Spring, Tex. 77389

Filed Jan. 13, 1992, Ser. No. 818,769
Int. Cl.[5] B23B *5/16*
U.S. Cl. 408—211 **16 Claims**



1. An adjustable reaming tool for installation in the bore of a tripping die head of a threading machine for reaming the outside and inside diameters at the end of a threaded pipe or conduit and for activating a trip mechanism to open the die head, the adjustable reaming tool comprising;

a generally cylindrical outer sleeve having a rear end adapted to be secured in a tool holder, a central bore extending rearwardly from the front end and a plurality of circumferentially spaced projections extending forwardly from the front end,

the interior surface of each said projection extending rearward and inward at an angel relative to the longitudinal axis to form an inwardly tapered reaming surface to receive and ream the outer diameter at the end of a pipe or conduit received thereon and terminating in a trip shoulder extending radially inward to said central bore and angled transversely to contact the end surface of the pipe or conduit being reamed,

said outer sleeve projections including said trip shoulder when viewed from the front end each have diametrically opposed flat leading edge surfaces and a flat tailing edge surface spaced generally parallel thereto in a clockwise direction from said leading edge surface and said inwardly tapered reaming surface extends therebetween,

an inner reamer insert having a cylindrical rear portion and a truncated conical forward end longitudinally fluted to define a plurality of circumferentially spaced wings extending longitudinally rearward and outward a distance from the front end at an angle relative to the longitudinal axis to form a segmented generally conical reaming portion to be received partially within the interior diameter of a pipe or conduit to ream the interior diameter at the end of the pipe or conduit received thereon,

said inner reamer insert rear portion slidably received within said outer sleeve central bore and said inner reamer insert wings positioned between said outer sleeve projections in alternating relation such that when viewed from the side, each said rearwardly and outwardly extending wing overlaps the adjacent trip shoulder of said outer sleeve projection and the adjacent angled surfaces cooperatively form a plurality of inwardly extending, flat bottom, V-shaped grooves with said trip shoulder forming the bottom of the groove, and

longitudinal adjustment means threadedly connected between the rear portions of said inner reamer insert and said outer sleeve along the the longitudinal axis to adjustably position said inner reamer insert wings longitudinally relative to said outer sleeve projections, whereby

the width of said flat-bottom, V-shaped grooves can be adjustably altered to receive pipe or conduit of various wall thicknesses and to simultaneously ream the exterior and interior diameters at the end of the pipe or conduit with said trip shoulder contacting the end surface of the pipe or conduit being reamed with sufficient force to activate the trip mechanism of the die head.

5,180,261

MOTOR-OPERATED TOOL

Wolfgang Schreiber, Stuttgart, Fed. Rep. of Germany, assignor to C. & E. Fein GmbH & Co., Leuschnerstrasse, Fed. Rep. of Germany

Filed Nov. 8, 1991, Ser. No. 789,740
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1990, 4037791
Int. Cl.[5] B23B *45/00*
U.S. Cl. 408—239 R **11 Claims**

1. A motor-operated tool, comprising:

a tool head, said tool head including a drive spindle having a driving opening;

a tool socket revolving about an axis and being designed as a drill chuck for clamping drills, spanners or the like, said tool socket including:

a drive shank fitting through said driving opening of said drive spindle;

snap-in locking means provided on said drive spindle for locking said drive shank against axial movement by

engaging said drive shank when said drive shank is introduced into said driving opening;

a release mechanism for releasing said drive shank from said drive spindle; and

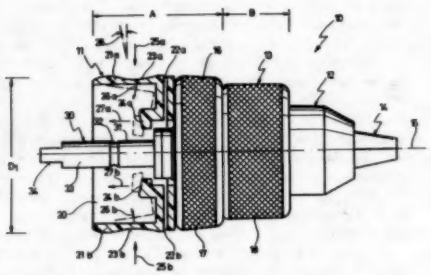
actuating means for actuating said release mechanism;

wherein said release mechanism comprises a sleeve and a plurality of radially displaceable elements, said sleeve being arranged on said drive spindle for axial displacement thereon and engaging or releasing said driving opening by said radially displaceable elements, depending on the axial position of said sleeve;

wherein said drive spindle includes a section which is configured as a ball cage;

wherein said radially displaceable elements are balls being held in said ball cage and being impinged by a spring element; and

wherein said sleeve is displaceable along said ball cage.



5,180,262

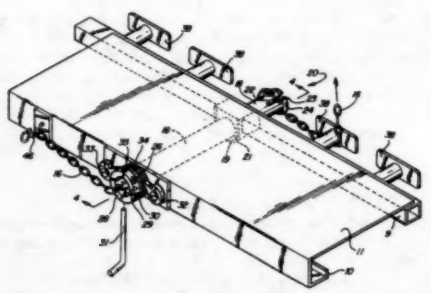
ADJUSTABLE CHAIN VEHICLE TIE-DOWN APPARATUS

Norman R. Westerdale, 45546 Emerald Forest Dr., Novi, Mich. 48374

Filed May 28, 1991, Ser. No. 705,853

Int. Cl.[5] B60P *7/08*

U.S. Cl. 410—12 **15 Claims**



1. An improved tie-down system for securing a vehicle to a ramp of a vehicle-hauling trailer, comprising:

chain means for securing the vehicle to the ramp;

tightening means mounted on the ramp and connectable to the chain means for adjusting the length of the chain means with respect to the vehicle, the tightening means comprising a rotatable hollow winch axle extending transversely across the ramp, including a first chain-engaging end on one side of the ramp for selectively engaging the chain means to connect the chain means to the tightening means and to permit adjustment of the length of the chain means with respect to the tightening means, and a second end on the other side of the ramp, said chain means extending through said hollow winch axle from said first end to said second end;

ladder means on the ramp for positioning a portion of the chain means extending from the chain-engaging end at a desired angle with respect to the vehicle on the ramp; and

locking means on the ramp for locking the tightening means against rotation with respect to the ramp.

5,180,263

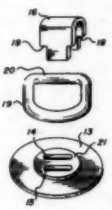
CARGO TIEDOWN ANCHOR

F. W. Flowers, Jr., 8207 Waterview Way, Winter Haven, Fla. 33884

Filed Feb. 28, 1992, Ser. No. 843,217

Int. Cl.[5] B61D *45/00*

U.S. Cl. 410—106 **15 Claims**



13. A cargo tiedown anchor for mounting on a vehicle or wall comprising a back plate having front and rear surfaces and a raised central circular portion on said front surface and rotatably positionable in an opening in a wall, there being a pair of slots in said raised portion, a U-shaped clip comprising a pair of legs having ends and a tiedown ring within said clip between said legs, said legs inserted in said slots in said raised portion such that said leg ends protrude beyond said rear surface of said back plate, and means on said back plate for attaching said clip to said back plate behind said wall with the opening.

5,180,264

ANCHOR BOLT

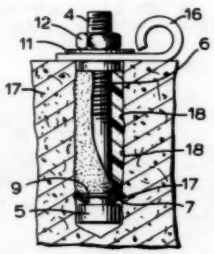
Robert M. Farwell, Stourbridge, England, assignor to Emhart, Inc., Newark, Del.

Filed Jan. 6, 1992, Ser. No. 817,176

Claims priority, application United Kingdom, Jan. 7, 1991, 9100258; Dec. 19, 1991, 9126976

Int. Cl.[5] F16B *13/04, 13/06*

U.S. Cl. 411—32 **2 Claims**



1. A sleeve anchor comprising

a bolt including a head portion and a threaded shaft portion,

a dished washer having an opening at the bottom for receiving said shaft portion and an enlarged opening at the top, said washer seated on said head portion with said bottom adjacent said head portion,

an annular washer having a central opening for receiving said shaft portion and having an outer diameter selected so

that said annular washer will engage said dished washer proximate said top opening,

a tubular resilient sleeve located on said shaft portion engaging said annular washer, and

nut means for forcefully urging said sleeve and annular washer against said dished washer to spread said dished washer outwardly into locking engagement with a hole in which said sleeve anchor is located.

5,180,265

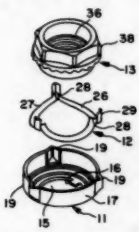
SELF LOCKING NUT

David Wiese, Torrance, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed Feb. 24, 1992, Ser. No. 840,057

Int. Cl.[5] F16B *39/32*

U.S. Cl. 411—150 **1 Claim**



1. A lock nut for being threaded onto and locked onto a threaded member such as a spindle, said threaded member and lock nut have a central axis and said threaded member having an axially extending keyway, said lock nut comprising:

a lock washer having a base, a central opening in said base, a key extending from said base into said opening to engage in said keyway, a peripheral wall rising from said base, said peripheral wall having a top edge, and a plurality of axially extending recesses in said peripheral wall, angularly spaced apart from one another, said recesses extending downwardly from said top edge;

a wave spring within said peripheral wall, said wave spring including a plurality of waves which include a bottom portion abutting said base, a plurality of ridges, and a plurality of retention tabs radially outward from said ridges and extending upwardly above them, fitting in said recesses in the peripheral wall and rising above said top edge of said peripheral wall;

a nut having an internal thread, a non-circular drive section, a bottom face abutting said base of said lock washer, a shoulder having an upper face and a lower face, said lower face facing toward said wave spring and said base, and having a plurality of radially-extending grooves facing and complementary to said ridges on said wave spring so as to hold the nut against rotation relative to said wave spring when the ridges are fitted in grooves, said upper face being engaged by a portion of the peripheral wall to hold the lock nut assembled,

said retention tabs being so disposed and arranged as to be contactible by a drive member to compress the wave spring and remove the ridges from the grooves to enable the nut to turn relative to the lock washer during installation or removal.

5,180,266

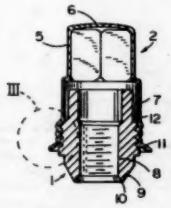
THREADED SHEET METAL DECORATIVE CAP

Christopher E. Nolan; Curtis M. Brown, both of Holland, and Jeffrey T. DeVries, Wyoming, all of Mich., assignors to Metal Flow Corporation, Holland, Mich.

Filed Apr. 30, 1992, Ser. No. 876,408

Int. Cl.[5] F16B *37/14*; B60B *1/00*

U.S. Cl. 411—429 **13 Claims**



1. A wheel lug nut and cap combination comprising:

a lug nut having a length, a central axis, a threaded axial bore on said axis to engage a threaded wheel stud, a tapered inner end shoulder, a hexagonal outer end portion, and outer peripheral machine cut threads between said inner and outer ends, each said thread having a pair of edges;

a lug nut cap cooperatively interfittable with said lug nut, being deep drawn to a length greater than said lug nut length; said cap having a hexagonal outer end portion equal in size to that of said lug nut outer end portion but axially offset from said lug nut hexagonal outer end portion and being closed on said outer end; said cap having an open inner end, an inner end portion, and formed peripheral threads on said inner end portion; said threads having a curvilinear, radiused root cross section, and a curvilinear, radiused crest cross section, and a pitch, spacing and lead angle compatible with the pitch, spacing and lead angle of said lug nut machine cut threads, to tightly interengage with said machine cut thread edges.

5,180,267

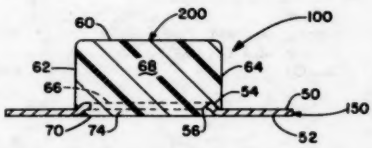
APPARATUS FOR PLASTIC BODY PANEL ATTACHMENT

Fredrick E. Greenlee, 2825 Hastings Rd., Silver Lake, Ohio 44224, and Charles T. Barnhardt, 1000 W. Highland Rd., Howell, Mich. 48843

Filed Sep. 17, 1991, Ser. No. 761,418

Int. Cl.[5] F16B *37/08, 39/28*

U.S. Cl. 411—432 **14 Claims**



1. A fastener for use in attaching a panel to a subassembly, the fastener being capable of withstanding repeated temperature swings of up to about 300° F. above a room temperature of about 70° F. without torque loss of a self-tapping screw inserted into the fastener comprising:

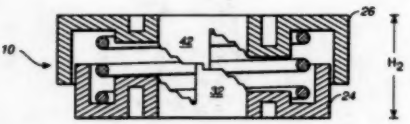
(a) a metallic base having an upper and a lower surface, the base additionally having an aperture disposed within the base;

(b) a raised arcuate lip around the aperture in the base, the lip defining a lower region; and

(c) a polymeric pad extending through the aperture, the pad being positioned such that a first portion of the pad extends into the lower region essentially terminating along a

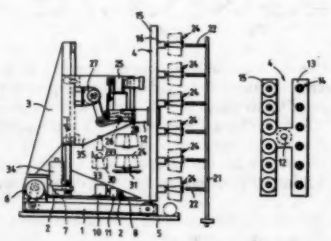
longitudinal plane of the lower surface of the base and a second portion of the pad extends above the lip.

5,180,268
EXPANSION WASHER
Arthur B. Richardson, One Greenwood Way, Mill Valley, Calif. 94941
Filed Jun. 12, 1992, Ser. No. 897,918
Int. Cl.[5] F16B *43/00*
U.S. Cl. 411—536 **9 Claims**



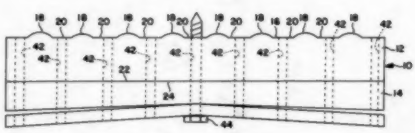
1. A structure comprising:
a first washer element having a hole therein along a first central axis and a first axis guide means, said first washer element having a first side including a first projecting ramp member,
a second washer element disposed adjacent to said first washer element wherein a third side of said second washer element faces said first side of said first washer element, said second washer element having a hole therein along a second central axis disposed generally coincident with said first central axis of said first washer element, said second washer element having a second axis guide means which when engaged with said first axis guide means permits relative motion between said first and said second washer element only around said coincident first and second central axes, and said third side of said second washer element having a second projecting ramp member disposed to contact said first projecting ramp member, wherein said second projecting ramp member includes at least one sloped ramp segment and at least one level step segment adjacent to one another and disposed to progressively engage said first projecting ramp member when said first washer element is rotated with respect to said second washer element; and
spring means connected between said first washer element and said second washer element.

5,180,269
YARN PACKAGE SUPPLY AND EMPTY BOBBIN REMOVING APPARATUS FOR WARPER CREEL
Yoshiyuki Nishioka, Kusatsu, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan
Filed May 31, 1991, Ser. No. 708,878
Claims priority, application Japan, Jun. 1, 1990, 2-57212[U]
Int. Cl.[5] B65H *67/00*
U.S. Cl. 414—331 **5 Claims**



1. In a warper creel having a plurality of pegs arranged in a plurality of rows, each adjacent pair of rows defining a distance therebetween, an apparatus for removing empty bobbins from the plurality of pegs and for putting yarn packages onto the plurality of pegs, the apparatus comprising:
a yarn package transfer frame comprising a first bar and a second bar, the first bar and the second bar being substantially mutually parallel,
a first plurality of holding devices associated with the first bar,
a second plurality of holding devices associated with the second bar,
the first and second plurality of holding devices being mutually spaced by a distance corresponding to the distance between adjacent rows of pegs,
whereby the yarn package transfer frame is shiftable by a distance corresponding to the distance between adjacent rows of pegs and whereby at least one of the first and second plurality of holding devices is positionable opposite from pegs from which empty bobbins have been removed.

5,180,270
WATER FLOW PATCH
Daniel F. Driscoll, 238 Sunnyhill La., Oconomowoc, Wis. 53066, and Dennis B. Cooper, 820 Back Bay Rd., Delafield, Wis. 53018
Filed Jun. 17, 1991, Ser. No. 716,226
Int. Cl.[5] F16B *33/00, 43/02*; E21D *11/00*
U.S. Cl. 411—369 **3 Claims**

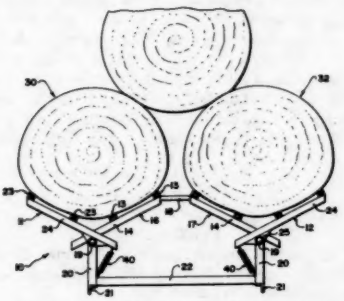


1. A seal comprising:
a) a first seal deformable layer being formed from a foam material and having a first surface scalloped in vertical cross-sectional dimension forming alternate ridges and valleys and a second smooth surface remote from and facing oppositely to said first surface;
b) a second seal flexible layer composed of a more dense and firm material than said first layer, said second layer having a first surface abutting said second surface of said first layer and a second surface facing oppositely to said first surface;
c) strapping means overlying the second surface of said second layer made from steel and disposed peripherally of said seal second layer;
d) registering apertures in said first and second seal layers and said strapping means; and
e) fastening means adapted to fit through said apertures to fasten said seal to pilot holes in a surface.

5,180,271
CYLINDRICAL BALE TRANSPORT DEVICE
David O. Farden, Box 539, Pilot Butte, Saskatchewan, Canada S0G 3Z0
Filed Oct. 16, 1991, Ser. No. 777,136
Int. Cl.[5] B60P *1/24*
U.S. Cl. 414—24.5 **13 Claims**

1. A bale transport device comprising a frame arranged for transport across the ground in a transport direction, the frame including a plurality of elongate longitudinal frame rails generally parallel to the transport direction and defining a length of the frame sufficient to receive thereon a predetermined number of cylindrical bales with an axis of the bales parallel to the frame members and a plurality of cross rails interconnecting the longitudinal frame rails, the frame including two parallel sides, a longitudinally extending fixed apex portion arranged

centrally between the sides and two inclined support portions each being formed from fixed longitudinal and transverse rails and defining a fixed support surface for receiving said bales thereon with the transverse rails extending from the apex portion to a respective one of the sides of the frame so as to be outwardly and downwardly inclined toward the respective side; two side support members each pivotally mounted on the frame at a respective one of the sides for pivotal movement about a longitudinal horizontal pivot axis at the respective side of the frame, each of the side support members being formed from longitudinal and transverse rails and defining a support



surface for receiving said bales thereon, each of the side support members being pivotally movable about said pivot axis between a first support position in which the support surface of the side support member is inclined outwardly and upwardly from the respective side so as to form with the support surface of a respective one of said inclined support portions a V-shaped receptacle for said bales, and a second unload position in which the support surface of the side support member is inclined outwardly and downwardly to allow a bale from said receptacle to roll under its own weight outwardly and downwardly for unloading onto the ground; and means for retaining said side support members in the first support position.

5,180,272

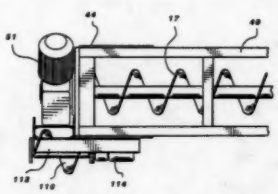
DEVICE AND METHOD FOR OUTLOADING BULK MATERIALS

David R. Campbell, Salt Lake City, Utah, assignor to Cambelt International Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 567,936, Aug. 15, 1990, Pat. No. 5,098,247. This application Feb. 19, 1992, Ser. No. 838,548

Int. Cl.[5] B65G *65/38*

U.S. Cl. 414—313 **19 Claims**



1. An apparatus for removing bulk materials from a laterally enclosed storage area wherein the apparatus may be substantially buried within the bulk material, said apparatus comprising:

(1.1) a support column having a top end, a bottom end, and a vertical axis;

(1.2) a base mount configured for attachment between the bottom end of the support column and a support surface within a central section of the storage area;

(1.3) first elongate transfer means for dragging the bulk material along a length of the first transfer means, when buried under the bulk material, toward a dispensing outlet near the bottom end of the support column, said first transfer means having a base end and a distal end;

(1.4) a first support frame having a base end, intermediate support section, and distal end, said distal end being coupled to the distal end of the first transfer means and being adapted with means for supporting the first transfer means during rotational movement;

(1.5) a first drive motor mounted at the distal end of the first transfer means and first support frame, said first drive motor further including means to apply a drive force to the first transfer means when in a buried configuration;

(1.6) an axial mount coupled between the base of the first support frame and bottom end of the support column, said axial mount including means for enabling rotational inclination of the first transfer means and first support frame from (i) a vertical orientation wherein the first transfer means is nearly parallel with the vertical axis of the support column, (ii) through intermediate angles of inclination, to (iii) a substantially horizontal orientation wherein the first transfer means is adjacent the support floor of the storage area;

(1.7) variable suspension means coupled between the support column and the first support frame for enabling variable selection and adjustment of inclination of the first transfer means by permitting rotational inclination with respect to the axial mount;

(1.8) rotational displacement means coupled to the first support frame for rotating the first transfer means and first support frame about the vertical axis of the support column to thereby provide for progressive removal of conical layers of surface material with each successive rotation;

(1.9) second elongate transfer means having a base end and a distal end, the second transfer means being disposed adjacent and lateral to the first drive motor, for preventing build-up of the bulk material against the first drive motor during rotation of the first support frame by dragging the bulk material along a length of the second transfer means;

(1.10) a second support frame mounted on the first support frame for supporting the second transfer means during rotational movement;

(1.11) a second drive motor operatively connected to the second transfer means for applying a drive force to the second transfer means.

5,180,273

APPARATUS FOR TRANSFERRING SEMICONDUCTOR WAFERS

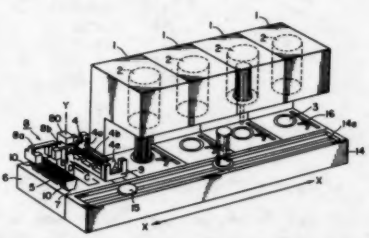
Kazuhiro Sakaya, Yokohama, and Shoichi Kodama, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 9, 1990, Ser. No. 593,963

Claims priority, application Japan, Oct. 9, 1989, 1-263444

Int. Cl.[5] B65G *69/00*

U.S. Cl. 414—404 **24 Claims**



1. An apparatus for transferring a plurality of semiconductor wafers to a wafer boat charging/discharging unit adapted to

charge the plurality of semiconductor wafers in a vertical position in a furnace tube of one of an array of vertical type dispersing furnaces, and to discharge the plurality of semiconductor wafers therefrom after the completion of a dispersing operation of the furnace tube, said apparatus comprising:

a wafer carrier holding section;

a plurality of wafer carriers each being disposed on said wafer carrier holding section and each carrying a predetermined number of semiconductor wafers, said predetermined number of semiconductor wafers being vertically aligned in a side-by-side relationship to each other;

a wafer boat having a bottom portion;

a wafer boat transfer means, having a wafer boat stage, for transferring said wafer boat;

a wafer displacer, having a vertically adjustable column and a turn head which is connected to said column and rotatable in a horizontal plane relative to said column, for displacing said predetermined number of semiconductor wafers from one of said wafer carriers into said wafer boat when said wafer boat is in a horizontal state; and

attitude changing means for holding said wafer boat and for raising said wafer boat between said horizontal state and a vertical state, wherein said attitude changing means is oriented in a horizontal position and is perpendicular to said wafer boat transfer stage when said wafer boat is in said horizontal state, and when said attitude changing means raises said wafer boat to said vertical state, said bottom portion of said wafer boat is positioned just above said transfer stage such that said wafer boat can be vertically transferred from said attitude changing means to said transfer stage;

wherein said wafer boat transfer stage includes means for transferring said wafer boat from said attitude changing means and carrying said wafer boat on a top portion thereof to a position in front of one of said array of vertical type dispersing furnaces.

5,180,274

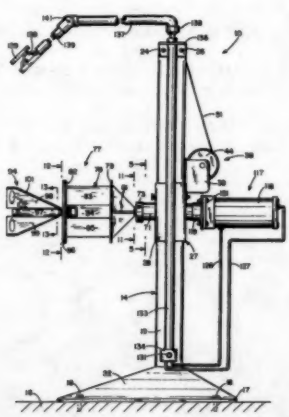
WHEEL HANDLING APPARATUS

Ronald E. Haugen, and David T. Murphy, both of Forest City, Iowa, assignors to Vix Design Products, Inc., Forest City, Iowa

Division of Ser. No. 519,581, May 7, 1990, Pat. No. 5,143,507. This application Sep. 23, 1991, Ser. No. 763,561

Int. Cl.[5] B60B *31/06*

U.S. Cl. 414—427 **9 Claims**



1. An apparatus for handling a wheel comprising: a frame, carrier means mounted on the frame, means mounting the carrier means on the frame for selected movement in upward and downward directions, lift means connected to the frame and the carrier means operable to move the carrier means in the upward direction and allow the carrier means to move in the downward direction, wheel holder means mounted on the carrier means for holding a wheel, said wheel holder means having a body and a head for holding a wheel, means mounting the body on the carrier means, and power means having a first member mounted on the carrier means and a second member supported on the means mounting the body on the carrier means, said second member being moveable relative to the first member upon operation of the power means, said head including a plurality of outwardly directed fin means having inwardly converging edges engageable with a portion of the wheel to hold the wheel against the body, said body having slot means to accommodate the fin means when the head is moved by the power means toward the body, means releasably connecting the head to the second member to allow the wheel to be located adjacent the body, whereby the head is moved by the power means toward the body to hold the wheel on said body to thereby support the wheel on the wheel holder means.

5,180,275

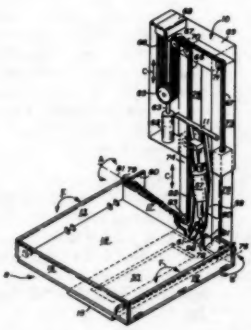
ROTARY BUS LIFT WITH POWER STOWABLE PLATFORM

Edward A. Czech, Winamac; Ronald W. Goodrich, Logansport, and Kevin L. Crawford, Winamac, all of Ind., assignors to The Braun Corporation, Winamac, Ind.

Filed May 28, 1991, Ser. No. 706,583

Int. Cl.[5] B60P *1/00*

U.S. Cl. 414—541 **21 Claims**



1. A passive rotary wheelchair lift for retrofit adjacent an entry/exit stair well of a transit vehicle comprising in operative combination:

a) a lift platform assembly which includes:

i) a generally planar platform having a first, longitudinal axis, and a second, transverse axis;

ii) at least one support arm disposed parallel to said transverse axis and beneath said platform to support said platform;

iii) a pivotable rollstop disposed to pivot from a generally vertical position to a generally horizontal position to permit entry of said wheelchair user onto said platform, said rollstop being disposed generally parallel to said transverse axis and at one end of said platform;

iv) a pair of spaced side walls oriented parallel to the longitudinal axis of said platform and disposed on opposed longitudinal sides of said platform;

b) means for lifting and lowering said platform disposed adjacent one of said longitudinal sides of said platform to permit said platform to be raised and lowered between a first, vehicle floor level to a second, lower level;

c) said platform being pivotally connected about an offset

axis adjacent a lower end of said lifting means so that said platform can be stowed in a generally vertical position;

d) means for rotationally supporting said lifting means along a generally vertical axis;

e) power means for rotating said lifting means and said platform from a first inboard position within said vehicle to an outboard position external of said vehicle with the wheel chair thereon so that said platform can be lowered to the ground;

f) means for mounting said lift in said vehicle;

g) means for powered rotation of said platform along a generally horizontal axis between a first generally horizontal deployed platform position to a second, generally vertical passive stowed platform position, said platform power stowage means being connected between said platform and said lifting means, said platform power stowage means being carried by said platform lifting means; and

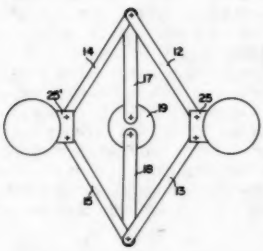
h) in combination, said lift in its stowed configuration permitting able bodied use of said stairwell, and wheel chair use when deployed into said stairwell.

5,180,276

ARTICULATED ARM TRANSFER DEVICE

Ruth A. Hendrickson, Lincoln, Mass., assignor to Brooks Automation, Inc., North Billerica, Mass.

Filed Apr. 18, 1991, Ser. No. 687,288
Int. Cl.[5] G25J *18/00*
U.S. Cl. 414—752 **9 Claims**



1. An apparatus for transferring objects, comprising:

a support;

a first upper arm supported on said support so as to be rotatable about a first axis;

a second upper arm supported on said support so as to be rotatable about a second axis; means connected between said first and second arms for causing said second upper arm to be driven by rotation of said first upper arm;

a first pair of forearms articulated to said first and second upper arms;

a second pair of forearms articulated to said first and second upper arms;

each of said upper arms being of lesser length than each forearm;

first holding means pivotally coupled to said first pair of forearms and second holding means pivotally coupled to said second pair of forearms, an engagement means connected between said first pair of forearms and preventing rotation of said first holding means, and an engagement means connected between said second pair of forearms and preventing rotation of said second holding means; and

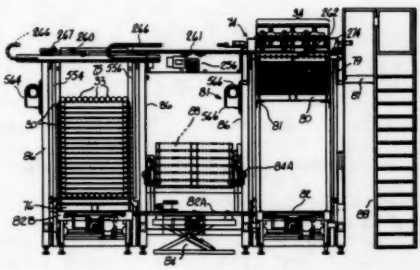
means capable of driving said first upper arm for rotation through an angle in the range of from greater than 120° up to and including 180° to move said first holding means between a first extended position and a first retracted position while simultaneously moving siad second holding means between a second retracted position and a second extended position.

5,180,277

CAN END HANDLING SYSTEM

Ronald A. Pearce, Lakewood, and Ira D. Hooker, Jr., Arvada, both of Colo., assignors to Rapsco Incorporated, Denver, Colo.

Filed Jul. 6, 1990, Ser. No. 549,463
Int. Cl.[5] B65B *5/06;* **B65G** *57/03*
U.S. Cl. 414—792.7 **12 Claims**



11. A system for delivering end members from a plurality of tray members and stacking a plurality of empty tray members on a pallet member for transport to another processing station and the system comprising:

a tray unloading station for unloading end members from a loaded tray member;

a depalletizing station for stacking empty tray members one on top of another on a pallet member;

a plurality of tray members, each tray member having a quadrilateral peripheral configuration being made of molded plastic material and comprising:

four peripheral side wall portions;

a central wall portion located between and integrally connected to said side wall portions; and

a plurality of parallel equally spaced equal length elongated compartment means of identical cross-sectional configuration extending between one pair of opposite side wall portions and parallel to another pair of opposite side wall portions;

a plurality of pallet members for supporting and transporting tray members to and from the tray unloading station and the depalletizing station;

a loaded tray supply elevator means at the tray unloading station for supplying loaded tray members to the tray unloaded station and supporting a pallet member with a plurality of stacked loaded tray members mounted on the loaded tray pallet member for sequentially transporting the loaded tray pallet member and the stack of loaded tray members thereon toward the tray unloading station;

tray holding means at the tray unloading station for receiving and holding one loaded tray member at a time received from the stack of loaded tray members on the loaded tray pallet member;

unloading means at said tray unloading station located adjacent one side of said tray members horizontally opposite one of said side walls of said tray members for horizontally advancing end members from the compartment means on the loaded tray member held by the holding means and unloading the end members from said compartment means to provide an empty tray member; and

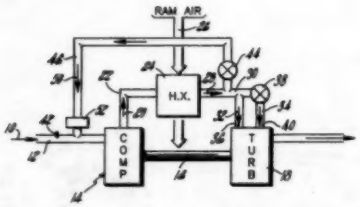
empty tray conveyor means for moving an empty tray member from the tray unloading station to another processing station.

5,180,278

SURGE-TOLERANT COMPRESSION SYSTEM

John L. Warner, Simsbury, Conn., assignor to United Technologies Corp., Hartford, Conn.

Filed Sep. 14, 1990, Ser. No. 582,273
Int. Cl.[5] F04D 27/02
U.S. Cl. 415—27 14 Claims



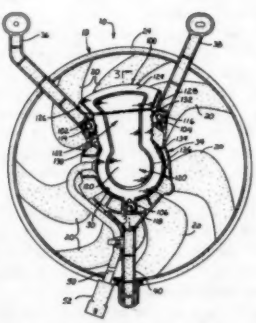
1. A surge-tolerant gas compression system, comprising:
a gas compressor having an inlet and an outlet;
means for extracting a surge flow portion of the compressor outlet flow;
means for delivering said surge flow to a gas receiving inlet plenum upstream of said inlet of said compressor;
a surge bypass valve, included in said delivering means, operable between a first, open flow state and a second, closed flow state; and
means for introducing said surge flow into said plenum such that said surge flow induces a vortex in the gas received in said plenum, said vortex having the same axis and direction of rotation as the rotor of said compressor.

5,180,279

HEAT SHIELD AND DEFLECTOR FOR ENGINE COOLING FAN MOTOR

Lee A. M. McLane-Goetz, Mt. Clemens, Mich.; Matthew J. Laramie, Apache Junction, Ariz.; Kevin L. McClelland, Mesa, Ariz.; Robert L. McCormick, Mesa, Ariz., and Allen L. Schultz, Mesa, Ariz., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 31, 1992, Ser. No. 861,222
Int. Cl.[5] F01D 5/08
U.S. Cl. 415—177 20 Claims



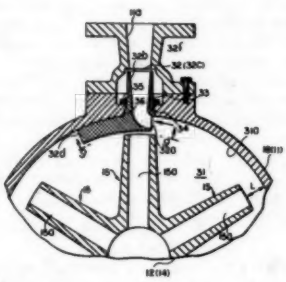
1. An assembly for cooling a vehicular engine compartment, comprising:
(a) a fan;
(b) a motor for rotating the fan;
(c) bracket means downstream of the fan for mounting the motor; and
(d) cover plate means to form heat shield means spaced from the motor having an air channel and deflector means for directing exiting airflow from the fan to the air channel.

5,180,280

CENTRIFUGAL PUMP

Toshiharu Honda, 20-103, 5-4, Yashio, Shinagawa-ku, Tokyo, Japan

Filed Dec. 7, 1990, Ser. No. 624,403
Claims priority, application Japan, May 28, 1990, 2-55823[U]; Sep. 13, 1990, 2-243604
Int. Cl.[5] F01D 1/02
U.S. Cl. 415—206 2 Claims



1. A centrifugal pump comprising:
(a) a cylindrical housing defining an internal space, the housing having a fluid intake opening and a fluid discharge opening and the internal space communicating with the outside space through the openings;
(b) an impeller retained rotatably in the center of the housing wherein said impeller and an interior peripheral surface of said internal space is separated from each other by predetermined distance;
(c) a diffuser, having a portion which protrudes from the interior peripheral surface of said internal space, having a fluid entry opening which is disposed at an upstream-side surface of the portion, and having a fluid exit opening communicating with said fluid discharge opening; and
(d) wherein said fluid exit opening is provided with a fluid guiding portion on which is formed a detaching means for detachably attaching said diffuser to said pump housing.

5,180,281

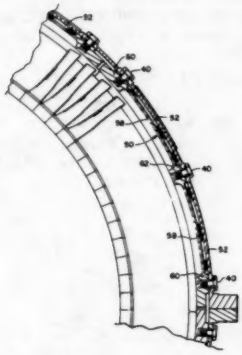
CASE TYING MEANS FOR GAS TURBINE ENGINE

Joseph C. Burge, Palm Beach Gardens, and Richard J. Tiernan, Jr., Hobe Sound, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 581,231, Sep. 12, 1990, abandoned. This application Feb. 3, 1992, Ser. No. 830,518
Int. Cl.[5] F01D 9/04
U.S. Cl. 415—209.2 3 Claims

1. For a gas turbine engine having a compressor section including an axially split outer engine case rotably supporting a drum rotor having axially spaced rows of circumferentially mounted compressor blades, comprising a plurality of axially spaced stator vanes, each stator vane including an outer shroud and a concentrically disposed inner shroud, defining therewith a gas path for the engine's working medium, a plurality of circumferentially spaced vanes disposed between said outer shroud and said inner shroud in said gas path and being disposed between adjacent rows of said compressor blades, hook-like elements extending radially outward from adjacent outer shrouds and spaced from said gas path, a segmented ring-like element defining a rail engaging each of said hook-like elements of adjacent outer shrouds spaced radially from said gas path and said outer engine case, each of said segments of said rail having a first boss and a second boss mounted at either end of said segment and a third boss mounted between said first boss and said second boss, and bolt means extending through openings in said outer engine case threadably engaging said first boss, said second boss and said third boss, whereby said

bolt means and said rail support said stator vanes to said outer engine case and said ring-like element being sufficiently flexible in response to engine thermal condition to have virtually no effect on said engine outer case.

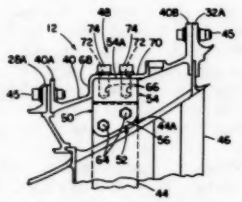


5,180,282

GAS TURBINE ENGINE STRUCTURAL FRAME WITH MULTI-YOKE ATTACHMENT OF STRUTS TO OUTER CASING

Kenneth J. Lenhart, Cincinnati; Michael L. Barron, Loveland, both of Ohio; Thomas G. Wakeman, Lawrenceburg, Ind., and Donald L. Bellia, West Chester, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Sep. 27, 1991, Ser. No. 766,249
Int. Cl.[5] F04D *29/34*
U.S. Cl. 415—209.2 **10 Claims**



1. A structural frame component for use in a gas turbine engine, said component comprising:

(a) an annular outer shell;

(b) an annular inner central hub;

(c) a plurality of circumferentially-spaced struts extending between the outer shell and central hub, each strut being attached at its inner end to said central hub; and

(d) a multi-yoke attachment including a plurality of yokes, each yoke including a clevis releasably attached between said outer shell and an outer end of a respective one of said struts, said clevis having a one-piece construction and including

(i) an inner bifurcated portion attached to opposite sides of said outer end of said one strut, and

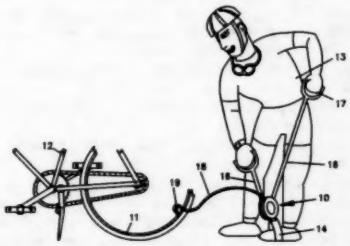
(ii) an outer base portion integrally connected to said inner bifurcated portion and attached to said outer shell, said outer base portion being disposed in an outer overlying relation to said outer end of said respective one strut outwardly from and attached to said inner bifurcated portion.

5,180,283

MANUAL TWO-STAGE AIR PUMP

Earle R. Vickery, III, 7301 Don Diego NE., Albuquerque, N. Mex. 87109

Filed Jul. 5, 1991, Ser. No. 726,388
Int. Cl.[5] F04B *33/00, 21/04*
U.S. Cl. 417—234 **21 Claims**



1. A pump for converting muscle power of a user to mechanical power, the pump comprising:

a frame means;

pulley means rotatably mounted on the frame means;

cable means attached to the pulley means, the cable means for providing cyclical alternating pulling motions in an opposite sense, the pulley means translating the cyclical pulling motions to alternating rotation motions in an opposite sense;

a drive shaft means attached to the pulley means;

a volume displacement means mounted on the drive shaft means, the drive shaft means translating the alternating rotation motions in an opposite sense to linear motion of the volume displacement means; and

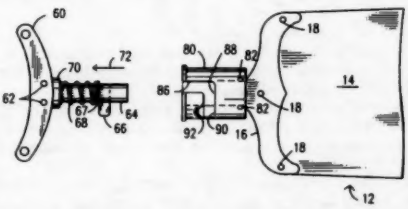
valve means in the volume displacement means, the valve means responsive to the linear motion of the volume displacement means.

5,180,284

DETACHABLE BLADES FOR CEILING FANS

Ernest W. Monrose, III, and Ernest W. Monrose, IV, both of 3872-50th Ave. S., St. Petersburg, Fla. 33711-4866

Division of Ser. No. 602,012, Oct. 23, 1990, Pat. No. 5,108,260. This application Mar. 3, 1992, Ser. No. 845,112
Int. Cl.[5] F04D *29/34*
U.S. Cl. 416—204 R **1 Claim**



1. A ceiling fan having detachably mounted, quickly removable individual fan blades, comprising:

a first mounting bracket having an arcuate base, said base having a predetermined circumferential extent;

said base being adapted to be fixedly secured to a drive ring of said ceiling fan;

a neck fixedly secured to said base, said neck being positioned equidistantly from opposite ends of said base and extending radially outwardly from said base;

a fixed position tab that extends radially from said neck;

a washer slideably mounted on said neck between said base and said tab;

a bias means positioned in captured relation between said base and said washer so that said washer is urged radially outwardly and bears against said tab when said bias means is in repose;

a fan blade having a radially inward end;

a second mounting bracket to which said radially inward end of said fan blade is fixedly secured;

a housing having a cylindrical side wall being fixedly secured to said second mounting bracket in radially inwardly extending relation thereto;

a "J"-shaped slot formed in said cylindrical side wall of said housing;

said slot having a predetermined width sufficient to slideably receive said tab; and

said predetermined width of said slot being insufficient to receive said washer;

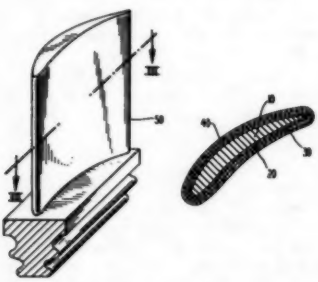
whereby insertion of said neck into said housing is accomplished when said tab is in alignment with said slot, wherien said bias means is loaded when said tab is driven into said slot, and wherein said bias means remains loaded when said tab is rotated into the end of said slot.

5,180,285

CORROSION RESISTANT MAGNESIUM TITANATE COATINGS FOR GAS TURBINES

Sai K. Lau, E. Amherst, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 7, 1991, Ser. No. 637,913
Int. Cl.[5] B63H *1/26*; C25D *11/02*; C03C *27/02*
U.S. Cl. 416—241 B **10 Claims**



1. In a gas turbine engine, an article of manufacture exhibiting wear and corrosion resistance and thermal protection at elevated temperatures found in a gas turbine engine comprising:

(a) a nickel base superalloy substrate;

(b) a metallic, aluminum oxide forming bond coating selected from the group consisting of MCrAlY, diffusion aluminides, and combinations thereof; and

(c) an oxidative overcoat deposited upon said bond coating, said overcoat comprising at least one protective magnesium titanate of the group consisting of $MgTiO_3$ and Mg_2TiO_4.

6. A process for protecting a metallic surface of a component used in a gas turbine at gas combustion temperatures, from corrosion due to the presence of nocuous chemical corrodants found in fuels, which comprises the following steps:

(a) providing a component having a metallic surface in a gas turbine;

(b) depositing on said metallic surface a thin, metallic, aluminum oxide forming bond coating comprising at least one of the group consisting of MCrAlY, diffusion aluminides, and combinations thereof;

(c) depositing on said bond coating a graded oxide overcoat comprising a combination of at least one bond coating agent and at least one protective magnesium titanate where said bond coating agent is selected from the group MCrAlY, diffusion aluminides, and combinations thereof, and said protective magnesium titanate is selected from the group $MgTiO_3$ and Mg_2TiO_4; and

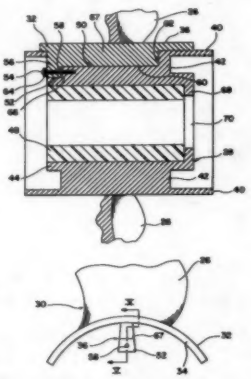
(d) depositing on said graded oxide overcoat a protective magnesium titanate of the group consisting of $MgTiO_3$ and Mg_2TiO_4.

5,180,286

PROPELLER ASSEMBLY

Peter E. Dean, 111 Hillside Dr., Monroe, Ga. 30655

Filed Sep. 25, 1990, Ser. No. 587,955
Int. Cl.[5] B63H *1/20*
U.S. Cl. 416—220 A **40 Claims**



1. A propeller assembly, comprising

a barrel having a forward end and an aft end;

a plurality of blade assemblies with each blade assembly including a blade, a base section, and a locking member, said locking member including a dovetail extension extending in a forward to aft direction and a leg member extending off of said dovetail extension,

said barrel further including slots extending in a forward to aft direction with each of said slots having a first slot section dimensioned to receive therein a respective one of said leg members, and a second slot section dimensioned to receive therein a respective one of said dovetail extensions; and

securement means for releasably securing said leg members to said barrel while positioned within said first slot sections.

5,180,287

METHOD FOR MONITORING FLUID FLOW FROM A VOLUMETRIC PUMP

Vernon R. Natwick, Los Altos; Michael W. Lawless, Poway; Joseph E. Doll, Saratoga, and Chung-You C. Wu, San Francisco, all of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 494,201, Mar. 15, 1990, Pat. No. 5,039,279. This application Aug. 12, 1991, Ser. No. 743,604
Int. Cl.[5] F04B *49/06*
U.S. Cl. 417—43 **20 Claims**

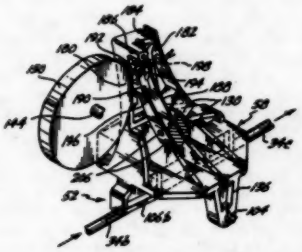
1. A method for determining whether fluid is flowing from a positive displacement pump, which includes an outlet valve that opens to allow fluid to flow past it during a pumping cycle, when a fluid pressure within the pump reaches a predefined cracking pressure, comprising the steps of:

producing a signal indicative of a movement of the outlet valve from a closed position to at least a partially open position that allows fluid to flow from the pump in re-

sponse to the fluid pressure within the pump exceeding the predefined cracking pressure;

establishing an electrical threshold for the signal;

comparing the signal to the threshold; and



determining that fluid is not flowing from the pump based upon the relative magnitudes of the signal and the threshold.

5,180,288

MICROMINIATURIZED ELECTROSTATIC PUMP

Axel Richter, and Herrmann Sandmeier, both of Munich, Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Förderung der Angewandten Forschung E.V., Müchen, Fed. Rep. of Germany

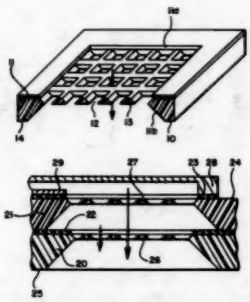
PCT No. PCT/EP90/00611, § 371 Date Oct. 29, 1991, § 102(e) Date Oct. 29, 1991, PCT Pub. No. WO91/02375, PCT Pub. Date Feb. 21, 1991

PCT Filed Apr. 17, 1990, Ser. No. 773,897

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1989, 3925749

Int. Cl.[5] H01J *41/18;* **F04D** *33/00;* **H02N** *11/00*

U.S. Cl. 417—48 **21 Claims**



1. A microminiaturized electrostatic pump including two electrodes (**13**; **26**, **27**; **33**, **34**; **43**, **44**; **53**, **54**; **63**, **68**; **73**, **78**), which are arranged in a essentially non-conductive fluid to be pumped and which are spaced apart essentially in the pump flow direction, said electrodes being adapted to have applied thereto a potential for injecting or for accelerating an ion current which flows between said electrodes through said fluid, and further including two components (**10**; **20**, **21**; **30**, **31**; **40**, **41**; **50**, **52**; **60**, **61**; **70**, **71**), which are arranged one on top of the other essentially in the pump flow direction and which are structured by etched openings in such way that the electrodes form an integral constituent part of said semiconductor components;

characterized in that components (**10**; **20**, **21**; **30**, **31**; **40**, **41**; **50**, **52**; **60**, **61**; **70**, **71**) and the electrodes (**13**; **26**, **27**; **33**, **34**; **43**, **44**; **53**, **54**; **63**, **68**; **73**, **78**) consist of a semiconductor material,

the main surfaces of said components (**10**; **20**, **21**; **30**, **31**; **40**, **41**; **50**, **52**; **60**, **61**; **70**, **71**) extend at right angles to the pump flow direction, and

the etched openings (**12**) extend through the components in the pump flow direction at both sides of each electrode.

5,180,289

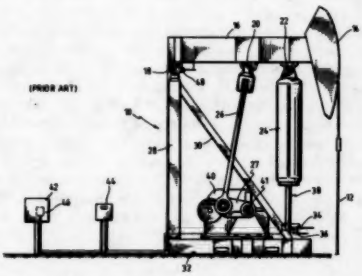
AIR BALANCE CONTROL FOR A PUMPING UNIT

Bruce Wenholz, Glendale, Calif.; R. H. Gault, Lubbock, Tex., and Kerry A. Jones, Bakersfield, Calif., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Aug. 27, 1991, Ser. No. 750,280

Int. Cl.[5] F04B *47/14*

U.S. Cl. 417—53 **8 Claims**



1. A method of controlling an air-balance compensation system in a sucker rod pumping unit having an electric motor and a sucker rod string, comprising the steps of:

a. sensing the current to the electric motor and developing a first signal indicative of this current;

b. continuously sensing sucker rod string position and developing a second signal indicative of this position; and

c. processing the first signal and the second signal to develop a control signal to control the air-balance compensation system.

5,180,290

FUEL INJECTION PUMPING APPARATUS

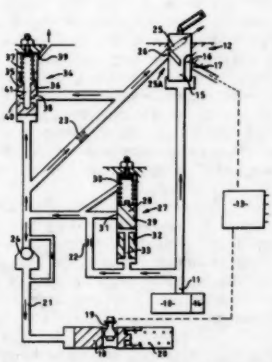
Alan C. Green, Maidstone, England, assignor to Lucas Industries, Birmingham, England

Continuation of Ser. No. 532,022, May 31, 1990, abandoned. This application Jun. 24, 1992, Ser. No. 905,078

Claims priority, application United Kingdom, Jun. 2, 1989, 8912649

Int. Cl.[5] F02M *39/02;* **F02D** *1/00*

U.S. Cl. 417—218 **3 Claims**



1. A fuel injection pumping apparatus for supplying fuel to a

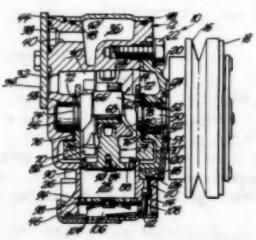
compression ignition engine comprising a low pressure pump the output pressure of which varies in accordance with the speed at which the apparatus is driven, a high pressure pump, a fuel pressure operable device for varying the timing of fuel delivery by the high pressure pump, means for controlling the quantity of fuel which is supplied by the high pressure pump, a first orifice through which fuel can flow from the outlet of the low pressure pump, a second orifice connected in series with the first orifice, the pressure intermediate said orifices being applied to the pressure operable device a variable orifice downstream of said second orifice and through which fuel can flow to a drain, the size of said variable orifice depending on the quantity of fuel delivered by the high pressure pump, with the degree of restriction increasing as the quantity of fuel supplied is decreased, a bypass valve connected in parallel with said variable orifice, said bypass valve including a spring loaded valve member slidable within a cylinder, a passage connecting one end of the cylinder to a point intermediate said first and second orifices so that with increasing pressure the valve member is moved against the action of the spring, a port opening into the wall of the cylinder, the port being connected to a point intermediate the second orifice and said variable orifice, a groove on the periphery of the valve member, said groove communicating with said drain, the groove as the valve member is moved against the action of the spring being brought into register with said port, the apparatus being characterised by a further restricted orifice interposed in the connection between said groove and the drain.

5,180,291

PULSATING OIL INJECTOR FOR RADIAL REFRIGERANT COMPRESSOR

Scott E. Kent, Albion, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 27, 1992, Ser. No. 874,317
Int. Cl.[5] F04B *27/04, 39/02*
U.S. Cl. 417—273 **1 Claim**



1. A radial refrigerant compressor assembly for use in automotive refrigerant systems and capable of being cycled between on and off conditions, said assembly comprising;

a housing defining a suction chamber operating at a first lower predetermined pressure and a discharge chamber operating at a second higher predetermined pressure, said housing adapted to be mounted to a support structure, and a rotatable shaft centrally supported within said housing;

a plurality of pistons radially disposed in said housing about said centrally supported shaft and adapted to reciprocate in cylinders so as to form compression chambers such that at least one piston reciprocates in a substantially vertical direction;

said discharge chamber being in fluid communication with said compression chamber formed by said at least one piston reciprocating in its respective cylinder so as to receive fluid exiting said compression chamber at said second higher discharge pressure and also to receive lubricant which collects in said discharge chamber associated with said lowest substantially vertically reciprocating piston;

a fluid passageway extending between said discharge chamber and said suction chamber, a valve means disposed within said fluid passageway, said valve means including a valve body and a valve member movable between first and second positions within said valve body to open and close said passageway;

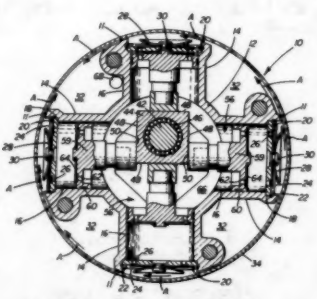
a biasing means disposed within said valve body and biasing said valve member to said first open position with a predetermined force to open said fluid passageway, said valve member also being responsive to a predetermined discharge pressure generated in said discharge chamber to overcome said biasing force of said biasing member and move said valve member to said second closed position to close the passageway such that lubricant which has collected in said discharge chamber is injected into said suction chamber through said fluid passageway and past said valve member by the force created by the pressure differential existing between said discharge chamber and said suction chamber when said radial compressor assembly is cycled from the off condition to the on condition and when said radial compressor assembly is cycled from the on condition to the off condition and while the biasing force of said biasing means is able to overcome the discharge pressure acting on said valve member to move said valve member to said first open position to distribute lubricant throughout the housing.

5,180,292

RADIAL COMPRESSOR WITH DISCHARGE CHAMBER DAMS

Naji G. Abousabha, Youngstown, and Khanh C. Tran, Lockport, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1991, Ser. No. 751,370
Int. Cl.[5] F04B *1/04*
U.S. Cl. 417—273 **7 Claims**



1. A radial compressor for compressing a refrigerant gas in an air conditioning system, comprising:

a cylinder block including a plurality of radially arrayed cylinders defining piston receiving bores;

piston means received for reciprocation in the bore of each cylinder;

means for driving said piston means in said bores;

means for providing low pressure refrigerant to said cylinders and into said bores;

an annular discharge chamber defined by an outer shell for receiving compressed, high pressure refrigerant gas from said bores;

a discharge port providing in communication with said discharge chamber for receiving the high pressure refrigerant gas; and

dam means extending from a first arcuate portion of one of said bores into said discharge chamber between at least one of said cylinders and said discharge port to a position more closely adjacent said outer shell than a second, opposing arcuate portion of said bore, to define a restricted flow passes for restricting pulsing flow of refriger-

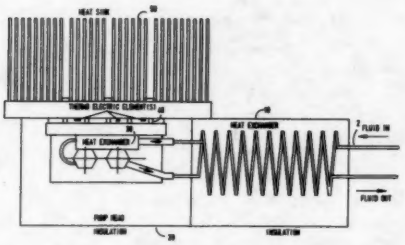
ant gas through said discharge chamber and reflecting incident pressure waves so as to restrict pulsing flow through said discharge chamber and reflect pressure waves to thereby significantly attenuate gas pulsations, vibration and noise associated therewith.

5,180,293

THERMOELECTRICALLY COOLED PUMPING SYSTEM

Hans-georg Hartl, Wilmington, Del., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 20, 1992, Ser. No. 855,185
Int. Cl.[5] F04B *39/06*
U.S. Cl. 417—366 **9 Claims**



1. A pumping system for pumping fluids at sub-ambient temperatures, comprising:

a pump head having an inlet and an outlet such that fluid flowing into the pump head through the inlet is compressed and outputted through said outlet; and

pump head heat exchanger means having an inlet and an outlet, wherein, said outlet is coupled to said pump head inlet; and

counter flow heat exchanger means having a first and second inlet and a first and second outlet, said first outlet being coupled to pump head heat exchanger inlet and said second inlet being coupled to said pump head outlet, wherein, the fluid to be pumped enters said first counter flow heat exchanger inlet and exits said second counter flow heat exchanger outlet, wherein, said fluid entering said second counter flow heat exchanger input is in thermal contact with fluid entering said first counter flow heat exchanger input; and

thermoelectric elements, coupled to said pump head heat exchanger means for dissipating heat from said pump head and cooling the pumping fluid;.wherein, said cooled pumping fluid exiting the pump enters said counterflow heat exchanger and precools said pumping fluid to sub-ambient temperatures prior to pumping.

5,180,294

CONCRETE PUMP HAVING PRESSURIZED SEAL FOR SWING TUBE

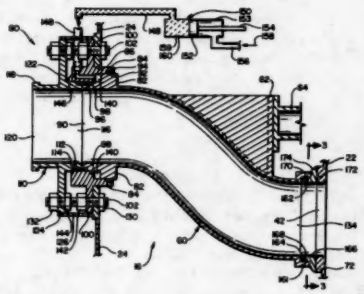
Ernest W. Watchorn, Vancouver, Canada, assignor to Confloat Consulting Ltd., Richmond, Canada

Filed Mar. 4, 1992, Ser. No. 846,222
Int. Cl.[5] F04B *7/00, 15/02*
U.S. Cl. 417—516 **26 Claims**

1. In a concrete pump having a plurality of pumping cylinders which charge and discharge alternately, each said cylinder having a port through which fluid concrete is discharged, and a pivotally mounted swing tube having an intake end which moves into and out of register with each said port alternately so as to receive said concrete which is discharged therefrom, a pressure sealing apparatus for providing a fluid-tight seal between said intake end of said swing tube and said ports with which said intake end is in register, said pressure sealing apparatus comprising:

a bearing assembly for pivotally supporting a discharge end of said swing tube, said bearing assembly comprising a first bearing portion mounted to a support structure and a second bearing portion mounted to said swing tube, said second bearing portion having a pressure face formed thereon to receive a force directed toward said intake end of said swing tube;

a lubricating medium positioned in said bearing assembly adjacent said pressure face on said second bearing portion; and



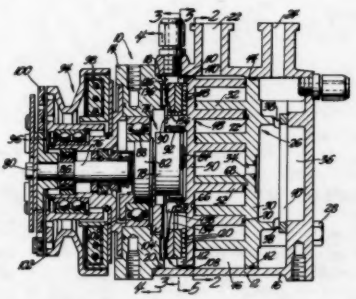
means for selectively supplying pressure to said lubricating medium in said bearing assembly so that said pressure applies said force toward said intake end of said swing tube to said pressure face thereon, and said force is transmitted from said pressure face to said swing tube so that said intake end of said tube is forced into sealing abutment with a said port with which said intake end of said tube is in register.

5,180,295

SCROLL COMPRESSOR OLDHAM COUPLING HAVING ANTI-FRICTION MEANS

James C. Swain, Columbus, and John P. Wilcox, Delaware, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 24, 1992, Ser. No. 825,352
Int. Cl.[5] F04C *18/04;* F16D *3/04*
U.S. Cl. 418—55.3 **3 Claims**



1. A scroll type fluid compressor having a housing with a front section and a rear section; a fluid inlet in the housing; a fluid outlet in the housing; a fixed scroll with an end plate, a spiral wrap and a central discharge aperture through the end plate, mounted in the rear section of the housing; an orbital scroll with an end plate and a spiral wrap cooperating with the fixed scroll to form fluid pockets; an orbital scroll drive including a crankshaft rotatably journaled in the front section of the housing, connected to the orbital scroll and operable to move the orbital scroll in an orbital path; and an axial thrust and anti-rotation assembly, including scroll key ways in a front

surface of the orbital scroll end plate having scroll key way center lines that are parallel to each other, housing key ways in the front section of the housing having housing key way center lines that are parallel to each other and angled with respect to the scroll key way center lines, a roller bearing mounted in the bottom of each housing key way, an Oldham coupler including a ring with a front surface and a rear surface, a first pair of key members extending from the rear surface of the ring and positioned in the scroll key ways, a second pair of key members extending from the front surface of the ring and positioned in the housing key ways and thrust rollers mounted between the orbital scroll and the Oldham coupler ring and contacting the rear surface of the Oldham coupler ring adjacent to the second pair of key members extending from the front surface of the ring, and in axial alignment with the second pair of key members.

5,180,296

HYDRAULIC MACHINE HAVING AXIAL USER PORTS

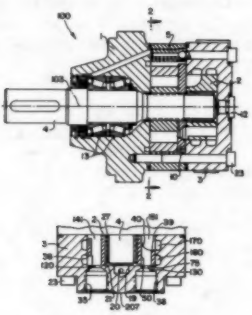
Horst Mehling, Lohr, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Continuation of Ser. No. 496,583, Mar. 21, 1990. This application Dec. 2, 1991, Ser. No. 798,997

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1989, 3909259

Int. Cl.[5] F01C *1/10, 21/12*

U.S. Cl. 418—61.3 **16 Claims**



1. A hydraulic machine comprising:

a housing,

a rotor rotatably mounted in said housing, said rotor having outer teeth,

a shaft to which said rotor is fixedly mounted for rotation therewith,

an outer gear rotatably mounted having inner teeth for cooperation with said outer teeth of said rotor, said housing being adapted to support said outer gear from the outside,

a commutator mounted sideways with respect to said rotor and said outer gear with a control disc therebetween, said commutator having a plurality of control slots, said control slots forming a first group and second group, said commutator being stationary with respect to said housing,

supply and discharge bores provided in said control disc,

a control housing for receiving said commutator and mounted to said control housing,

a first ring chnanel and a second ring channel axially spaced in said control housnig, said first and second ring channels extending radially and surrounding said commutator,

user ports disposed in said control housing,

wherein said commutator is configured to allow said user ports to extend from said housing in an axial or radial direction.

5,180,297

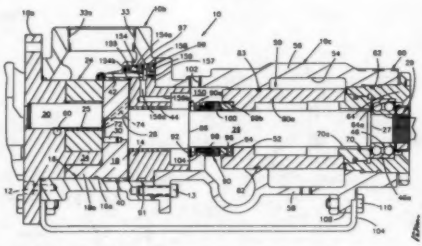
FLUID TRANSFER PUMP WITH SHAFT SEAL STRUCTURE

Milton N. Hansen, and Steven D. McMahon, both of Mansfield, Ohio, assignors to The Gorman-Rupp Company, Mansfield, Ohio

Filed Mar. 22, 1991, Ser. No. 674,501

Int. Cl.[5] F04C *15/00*

U.S. Cl. 418—104 **26 Claims**



1. A fluid transfer pump, comprising:

a) a pair of gears positioned in meshing relationship within a pump chamber defined by a housing;

b) a drive shaft extending axially from one of said gears adapted to be connected to a pump drive means;

c) a backhead surrounding at least a portion of said drive shaft;

d) sealing apparatus including seal means for inhibiting fluid leakage between said drive shaft and said backhead, said sealing apparatus comprising:

i) a removable sleeve-like insert positioned within said backhead and around a portion of said drive shaft;

ii) an insert support member removably engaged with an end portion of said backhead including end engaging means for supporting one end of said insert in coaxial alignment with said drive shaft; and,

iii) insert engagement structure defined by said backhead engaging said insert at a location spaced from said one end and including means for providing sealing engagement between said structure and said insert, said insert engagement structure supporting another end of said insert in coaxial alignment with said drive shaft;

iv) seal mounting means forming part of said insert operative to mount at least a portion of said seal means in sealing alignment with said drive shaft.

5,180,298

HYDRAULIC PUMP WITH FOAMED ELASTOMERIC MEMBER IN OUTLET CHAMBER TO REDUCE LIQUID-BORNE NOISE

John DiRe, Charlotte, N.C., assignor to IMO Industries Inc., Princeton, N.J.

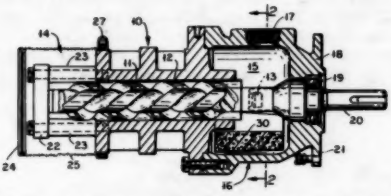
Filed Jan. 23, 1991, Ser. No. 644,451

Int. Cl.[5] F04C *15/00*

U.S. Cl. 418—181 **8 Claims**

1. A displacement-type hydraulic pump, comprising a rotor-housing part having axially spaced inlet and outlet ends and a cover part secured to the outlet end of said rotor-housing part, an elongate rotor having a pumping portion within said rotor-housing part and a driven portion journalled for rotation in said cover part, said cover part coacting with the outlet end of said rotor-housing part to define an annular chamber surrounding a portion of said rotor for receiving pumped hydraulic fluid discharged at the outlet end of said rotor-housing part, said chamber having an outlet port for discharge of pumped hy-

draulic fluid from said chamber, and a body of foamed elastomeric material retained within said chamber at offset from said



outlet port, said body of elastomeric material having a volume that is in the range of 0.1 to 0.3 of the volume of said chamber.

5,180,299

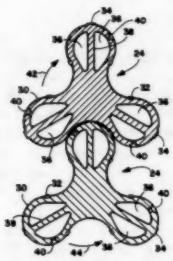
ROOTS TYPE SUPERCHARGER

James J. Feuling, Ventura, Calif., assignor to Feuling Engineering, Inc., Ventura, Calif.

Filed Apr. 27, 1992, Ser. No. 873,817

Int. Cl.[5] F04C *18/18*

U.S. Cl. 418—190 **11 Claims**



1. An improved Roots type supercharger which comprises:

a housing having a gas inlet and gas outlet;

a pair of elongated parallel rotors mounted for rotation within said housing;

each of said rotors having at least two elongated parallel lobes adapted to have the lobes on one rotor intermesh with minimum clearance with the lobes on the opposite rotors;

means for rotting said rotors to force gas from said inlet toward said outlet;

two independent longitudinal chambers within each if said lobes; and

a plurality of openings through each of said lobes connecting the interior of said housing with a selected one of said chambers, at least some of said openings arranged along the leading face of each lobe as said lobe moves toward the adjacent rotor;

whereby gas compressed between each meshing rotor and adjacent rotor escapes into said chamber.

5,180,300

LOW NOX REGENERATIVE BURNER

James E. Hovis, and Harry P. Finke, both of Pittsburgh, Pa., assignors to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 469,075, Jan. 19, 1990, abandoned, which is a division of Ser. No. 168,892, Mar. 16, 1988, Pat. No. 4,983,118. This application Apr. 3, 1991, Ser. No. 681,441

Int. Cl.[5] F87D *17/00*

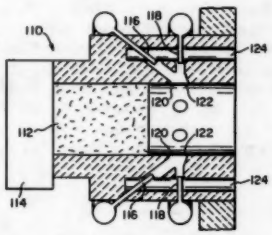
U.S. Cl. 431—115 **10 Claims**

1. A regenerative burner for heating a furnace chamber and alternately receiving spent combustion gases therefrom, said burner comprising:

a burner body in fluid communication with said furnace chamber;

at least one heat storage unit adjacent said furnace chamber and in fluid communication with said burner body, said heat storage unit collecting heat from spent combustion gases exiting the furnace chamber through said burner body;

means for directing combustion air through said heat storage unit and introducing it to said burner body, said means



comprising a blower and a duct in fluid communication with said blower and said heat storage unit;

said burner body having means for generating a negative pressure to draw products of combustion from said furnace chamber back to said burner body for vitiating combustion air, said means comprising at least one fuel nozzle disposed within a venturi, said venturi leading to a central chamber of said burner and in fluid communication with said furnace chamber via a vitiation duct therebetween.

5,180,301

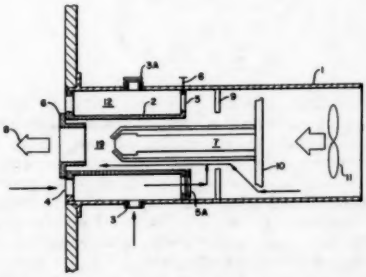
AIR-OIL BURNER

Daniel Gross, 7 Sparrow La., Levittown, Long Island, N.Y. 11756

Filed Aug. 21, 1991, Ser. No. 700,361

Int. Cl.[5] F23L *7/00*

U.S. Cl. 431—116 **6 Claims**



1. In a fuel burner assembly comprising an outer wall, an inner wall concentric with said outer wall, said inner wall defining a central chamber, a fuel delivery nozzle in said central chamber, said outer and inner walls defining an annular chamber surrounding said central chamber, primary air supply means upstream of said central chamber for supplying a stream of air to said central chamber, means for supporting the downstream end of said inner and outer walls of said assembly to a combustion chamber, said downstream end of said central chamber communicating with said combustion chamber, the improvement comprising:

said annular chamber extending in the upstream direction from its downstream end past the downstream end of said nozzle and terminating at its upstream end downstream of said primary air supply means;

first port means at said downstream end of said annular

chamber for receiving heated combustion air from the combustion chamber into said annular chamber;

second port means in said outer wall communicating with said annular chamber for receiving secondary air from outside of said annular chamber into said annular chamber;

third port means at said upstream end of said annular chamber for passing the mixed heated combustion air and secondary air to said central chamber;

baffle means upstream of said third port means for controlling the stream of air from said primary air supply means to said first chamber and for directing the mixed heated combustion air and secondary air into the stream of air from said primary air supply around said nozzle;

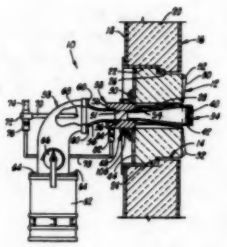
said central chamber comprising channel means for supplying the mixed heated combustion air and secondary air from said annular chamber along with said stream of air from said primary air supply means to the combustion chamber.

5,180,302

RADIANT GAS BURNER AND METHOD

Robert E. Schwartz, Tulsa, and Robert R. Trimble, Sand Springs, both of Okla., assignors to John Zink Company, a Division of Koch Engineering Company, Inc., Tulsa, Okla.

Filed Feb. 28, 1992, Ser. No. 843,452
Int. Cl.[5] F23D *14/12*
U.S. Cl. 431—348 **13 Claims**



1. In a radiant gas burner comprised of a refractory burner tile adapted to be inserted in a wall of a furnace and including an elongated passageway extending therethrough having an exterior end and an interior end, a burner tube disposed within the passageway having a nozzle positioned at the interior end of the passageway for directing a fuel gas-air mixture adjacent to the refractory burner tile within the furnace space, and means for introducing a fuel gas-air mixture into the burner tube attached thereto, the improvement which comprises:

said burner tube being of a one-piece elongated construction and being connected to said means for introducing a fuel gas-air mixture thereinto by a threaded connection positioned adjacent to the exterior end of said passageway whereby said threaded connection remains relatively cool during the operation of said burner and said burner tube thereby remains selectively threadedly removable;

said means for introducing a fuel gas-air mixture into said burner tube including a manifold block having a fuel gas-air mixture passage formed therein threadedly connected to said burner tube at one end and to a device for controlling the ratio of fuel to air at an opposite end, and

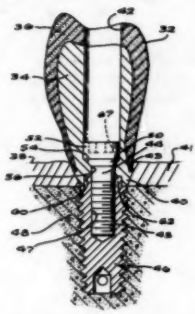
means for sealingly connecting said manifold block to the exterior end of said burner tile passageway to thereby prevent the unregulated flow of air into said passageway attached to said burner tile and to said manifold block.

5,180,303

RETRIEVABLE DENTAL PROTHESIS APPARATUS AND METHOD OF FABRICATION

Wynn E. Hornburg, Stanton, and John Beumer, III, Los Angeles, both of Calif., assignors to Regents of the University of California, Oakland, Calif., by said John Beumer, III

Continuation of Ser. No. 247,298, Sep. 21, 1988, abandoned. This application Aug. 15, 1991, Ser. No. 749,494
Int. Cl.[5] A61C *8/00*
U.S. Cl. 433—173 **37 Claims**



1. A retrievable dental prosthesis adapted to be removably connected by a screw to an implant anchor, said implant anchor adapted to be embedded in a patient's dental bone structure and to be disposed below a top surface of said patient's overlying gingiva, said dental prosthesis comprising an integral cast metal portion removably connected to said implant anchor, said cast metal portion being shaped to generally represent contours of a tooth of said patient to be replaced by said prosthesis, said cast metal portion having a base with an annular bottom surface and means at said base for engaging said implant and interlocking therewith in order to prevent rotation of said cast metal portion with respect to said implant anchor, said cast metal portion having an access aperture passing therethrough from an upper position above said base downward toward said base, said screw being disposed inside and at a bottom of said aperture in order to removably connect said cast metal portion to said implant anchor so that said top surface of said patient's overlying gingiva and directly interfaces with said implant anchor, and so that said base interlocks with said implant anchor below said top surface of said gingiva, said aperture providing access to said screw so that said screw is capable of being selectively (a) loosened in order to remove said cast metal portion from said implant, and (b) tightened in order to removably connect said cast metal portion to said implant anchor.

5,180,304

METHOD FOR APICAL FUSION OF THE FORAMINA

Arthur Vassiliadis; Joseph W. Shaffer, both of Mountain View; David J. Fullmer, Foster City; Michael H. Brewer, Felton; David R. Hennings, Newcastle, all of Calif., and Terry D. Myers, Farmington Hills, Mich., assignors to American Dental Laser, Inc., Troy, Mich.

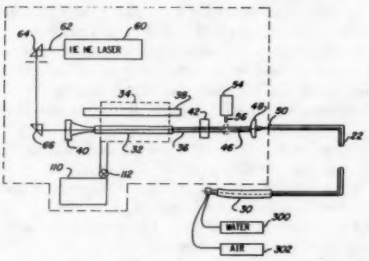
Division of Ser. No. 707,163, May 28, 1991, which is a division of Ser. No. 493,965, Mar. 15, 1990, Pat. No. 5,055,048, which is a continuation-in-part of Ser. No. 342,190, Apr. 24, 1989, Pat. No. 4,940,411, which is a continuation-in-part of Ser. No. 236,450, Aug. 25, 1988, abandoned. This application Dec. 6, 1991, Ser. No. 804,835
Int. Cl.[5] A61C *5/02*
U.S. Cl. 433—224 **6 Claims**

1. A method for the apical fusion of foramina of a tooth in a mouth, comprising the steps of:

aiming a pulsed laser so that the output from the laser im-

pinges upon the area of the tooth surrounding the foramina,

repeatedly activating the laser until the area surrounding the foramina melts and fuses the foramina,



wherein said laser has an energy output per pulse sufficient to melt the area surrounding the foramina,

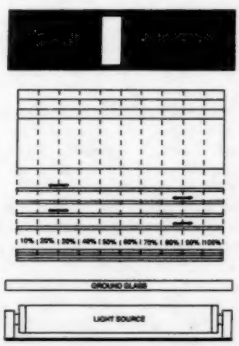
wherein said laser has an energy output of between 0.1 millijoules per pulse and 5 joules per pulse.

5,180,305

PROCESS COLOR SEPARATION GUIDE FOR COLOR TRANSPARENCIES

Ronald P. Farrah, 5219 42nd St., NW., Washington, D.C. 20015-1931

Filed Mar. 26, 1990, Ser. No. 498,686
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—102 **6 Claims**



1. A method for matching the color of a color transparency in the process of color printing comprising the steps of:

(a) selecting from a series of screen transparencies of magenta, cyan, yellow and black graduated in a consistent progression of color gradation, at least one of said screen transparencies;

(b) placing said screen transparency adjacent to said color transparency;

(c) comparing the color of said screen transparency with the color of said color transparency; and

(d) if necessary, sequentially repeating steps (a), (b) and (c) until the colors match.

5,180,306

EDUCATIONAL ART GAME

Thomas R. McInroy, 409 E. Market Street, McConnellsburg, Pa. 17233, and Nancy S. McInroy, 306 Burton Street, Bath, N.Y. 14810

Filed Feb. 4, 1991, Ser. No. 650,188
Int. Cl.[5] G09B *19/22;* **A63F** *1/00, 9/20*
U.S. Cl. 434—129 **4 Claims**

1. A method of playing a card game by a number of players as follows:

a. distributing among said players a deck of cards, said deck including a single Art Man card and a number of matching pairs of cards each bearing a pictorial representation of a work of art;

b. a first player tabling any and all matching pairs in his hand while reciting the name and origin of each work of art represented thereon, taking one card from the player on his side opposite the progression of play, and similarly tabling a pair if one results from such taking;

c. the next player tabling any and all matching pairs in his hand while reciting the name and origin of each work of art represented thereon, taking one card from the previous player, and similarly tabling a pair if one results from such taking; and

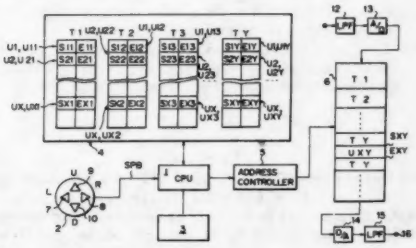
d. repeating step c until all cards showing works of art have been matched and tabled and only the Art Man card remains.

5,180,307

LEARNING APPARATUS

Tamihei Hiramatsu, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 9, 1990, Ser. No. 564,872
Claims priority, application Japan, Aug. 22, 1989, 1-215355
Int. Cl.[5] G09B *19/06, 19/08*
U.S. Cl. 434—157 **2 Claims**



1. An apparatus comprising:

a memory containing a first plurality of data units, wherein each of the data units in the first plurality of data units is first language audio teaching material, and a second plurality of data units, wherein each of the data units in the second plurality of data units is second language audio teaching material, and wherein each of the data units in the second plurality of data units corresponds logically to a unit of said first plurality of data units;

switching means for selecting among units in said first and second pluralities of data units, wherein the switching means comprises a first set of cursor operation switches for switching between logically corresponding data units in said first and second pluralities of data units, and a second set of cursor operation switches for switching between data units within said first plurality of data units or within said second plurality of data units; and

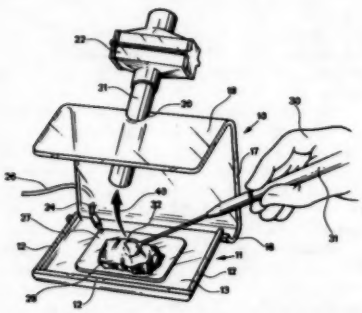
reading means for reading each selected unit of data from said memory.

5,180,308

MEDICAL DEMONSTRATION MODEL

Jon C. Garito, 264 Hedge La., Hewlett Harbor, N.Y. 11577, and Alan G. Ellman, 1 Auerbach La., Lawrence, N.Y. 11516

Filed Jan. 6, 1992, Ser. No. 817,045
Int. Cl.[5] G09B *23/28*
U.S. Cl. 434—262 **8 Claims**



1. A demonstration model for medical, dental or veterinary procedures involving a burning treatment or the like of an animal tissue specimen likely to generate smoke or noxious vapors comprising:

a generally C-shaped structure having a bottom portion sized to accommodate the specimen, a top portion, and a single side portion solely supporting the top portion on and extending above and over the bottom portion,

means for connecting to the C-shaped structure suction-generating means for providing within the structure over the bottom portion a suction force sufficient to remove any smoke or noxious vapors generated during the treatment, said connecting means comprising a hole in an upper part of the structure to receive a tube connected to the suction-generating means,

the front of the C-shaped structure being open to allow access to a specimen on the bottom portion by a burning instrument manipulated by a person demonstrating the procedure.

5,180,309

AUTOMATED ANSWER EVALUATION AND SCORING SYSTEM AND METHOD

Michael E. Egnor, Orlando, Fla., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 4, 1990, Ser. No. 621,420
Int. Cl.[5] G09B *7/00*
U.S. Cl. 434—323 **1 Claim**

1. A method of computerized education, testing and entertainment in a format suitable for competition wherein participants are encouraged by the granting of full and partially credit for answers that demonstrate only partial knowledge of the subject matter, said method comprising:

designating a first category;

preparing a first question for said first category having at least one character;

preparing an answer to said first question that has a plurality of parts wherein a first part thereof is at least one character in length and is the perfect answer to said question, and a second part thereof is a preselected character code that determines the deviation by a numerical value from said perfect answer that will be tolerated for credit;

designating at least one additional category, and preparing at least one question therefor and an answer thereto, as above for said first category; converting a general purpose computer to a special purpose device by programming it to perform the following steps;

prepare an electronic question-answer set from the questions and answers in each said category;

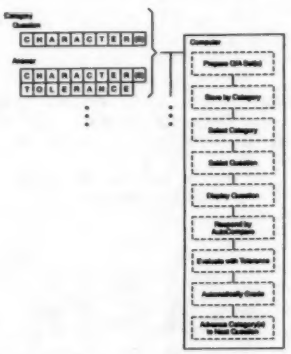
store in order by category for electronic retrieval the question-answer sets prepared;

select in accordance with and in response to input from a keyboard one said category;

randomly select and retrieve from electronic storage a first question from the question-answer set of the selected category, and retrieve from electronic storage for comparison the answer to the selected question;

visually display said randomly selected question;

respond to an input from said keyboard by automatically comparing the character that appears in a first position



of the input to the character in the corresponding first position of the retrieved answer for said first question, and by automatically comparing the character in each additional position of the input to the corresponding position of the retrieved answer;

evaluate said input from the keyboard in accordance with said comparison and the answer's numerical tolerance value, wherein a tolerance value of zero requires in order for credit to be given that the characters in the response match position by position the corresponding characters in said retrieved answer, a value greater than one identifies an answer in numeric form and for credit to be given requires that the response not deviate from the answer by more than the tolerance value, and a tolerance value between one and zero requires for credit to be given that the percent of characters in the response which match position by position the characters in the retrieved answer be greater than or equal to the percentage value of the tolerance;

grading said input automatically in accordance with said evaluation, wherein an input in which all characters in the input match the corresponding characters in the answer is awarded a predetermined full credit value, and a input that is not awarded full credit value is awarded partial credit value if the input is within the answer's tolerance value; and

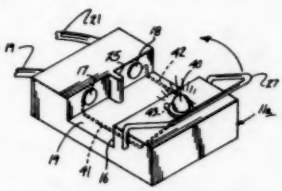
advancing in response to said evaluation, each said category by one question.

5,180,310

AUTOMOTIVE JUMPER CABLE APPARATUS

Clifford J. Miller, P.O. Drawer BBB, Kinder, La. 70648

Filed Oct. 18, 1991, Ser. No. 779,326
Int. Cl.[5] H01R *33/00*
U.S. Cl. 439—34 **3 Claims**



1. An automotive jumper cable apparatus, comprising,

a mounting block arranged for securement within a vehicle, wherein the mounting block includes a block top wall defining a recess directed into the mounting block from the top wall, wherein the recess includes a recess floor, a recess front, and a recess rear wall, and the mounting block including spaced mounting block side walls, wherein the recess extends coextensively through the side walls in an orthogonal orientation, and

a respective first and second electrical contact plate fixedly mounted within the recess to the front wall, the first electrical contact plate including a first battery wire extending exteriorly of the mounting block in electrical communication with the first contact plate, and

a second battery wire extending exteriorly of the mounting block in electrical communication with the second contact plate, the first battery wire including an in-line fuse, and the second battery wire including an on/off switch contained therewithin, and

the first battery wire including a first terminal, the second battery wire including a second terminal, and

a connector block complementarily received within the recess, the connector block including a third electrical contact plate coaxially aligned with the first electrical contact plate when the connector block is mounted within the recess, and a fourth electrical contact plate mounted to the connector block coaxially aligned with the second contact plate when the connector block is mounted within the recess, and

the third electrical contact plate in electrical communication with a first connector cable, and

the fourth electrical contact plate in electrical communication with a second connector cable, wherein the first connector cable and the second connector cable extend exteriorly of the connector block, and

the connector block includes a front wall and the third electrical contact plate and the fourth electrical contact plate are mounted to the front wall, and the connector block including a rear wall spaced from and parallel the front wall, and the connector block including a connector block top wall spaced from and parallel a connector block bottom wall, the connector block top wall spaced from the connector block bottom wall a predetermined height, and the connector block top wall and the connector block bottom wall defined by a length equal to a predetermined length, wherein the recess front wall and the recess rear wall are defined by a height equal to the predetermined height, and the recess floor is defined by a length equal to the predetermined length, and the connector block front wall includes a connector block recess orthogonally oriented between the top wall and bottom wall extending coextensively between the top wall and the bottom wall directed into the connector block front wall, and the recess front wall including a front wall rib, the front wall rib extending orthogonally relative to the recess floor and the mounting block top wall, wherein the front wall rib is complementarily received within the connector block recess when the connector block is mounted within the recess, and

the first connector cable and the second connector cable include a respective first and second spring clamp mounted to the respective first and second connector cable, and

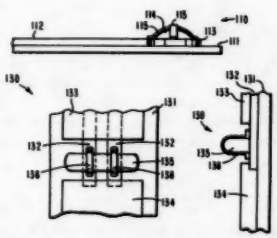
a "U" shaped spring biased bale pivotally mounted to the mounting block and biased to extend into the recess to secure the connector block within the recess.

5,180,311

RESILIENT INTERCONNECTION BRIDGE

Christopher M. Schreiber, Newport Beach, and William R. Crumly, Anaheim, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 22, 1991, Ser. No. 643,310
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—74 **5 Claims**



1. A resilient interconnection bridge for providing matable/-dematable connection between electrical components, comprising:

a flexible substrate layer of insulating material;

a compliant, elastomeric member formed on a portion of the layer, the member elongated along a first direction and providing a raised feature; and

at least one conductive trace extending in a direction generally orthogonal to the first direction and bonded to the layer, wherein the conductive trace is bonded to the layer in a first region on one side of the member, crosses the elastomeric member, wherein the elastomeric member protrudes to form, along with the conductive trace, a raised interconnection feature, and is bonded to the layer in a second region on the other side of the member.

5,180,312

PRESS FIT PINLESS LATCHING SHROUD

Edward G. Martin, Plano, Tex., assignor to DSC Communications Corporation, Plano, Tex.

Filed Jan. 23, 1991, Ser. No. 644,892
Int. Cl.[5] H01R *23/72*
U.S. Cl. 439—78 **3 Claims**

1. A shroud for retaining at least one connector, the connector containing at least one column of sockets for mating with a group of pins protruding from a surface, said shroud further comprising:

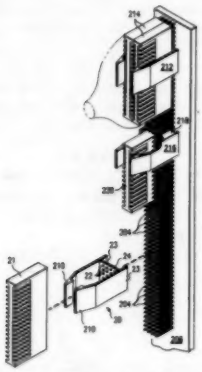
a base member containing a plurality of holes operable for receiving a portion of the group of pins, said holes having a tapering entry way with an opening larger than the pins leading to an exit way with cross-section substantially similar to the cross-section of the pins;

four leg members attached to said base, operable for causing said base to be positioned away from the surface;

two brackets attached to said base aligned parallel and facing

each other across the width of said holes and operable by flexing away from each other for receiving the connector in a temporarily interlocked manner;

two bracket stops attached to said base aligned parallel to and facing each other across the length of said holes for



preventing the hyperflexing of said brackets, said bracket stops each containing a plurality of cavities operable for receiving a plurality of the pins; and

one member mounted on each of said bracket stops operable for guiding the connector to a particular matrix of said holes.

5,180,313

GROUND CONNECTION FOR THE SPARK PLUGS OF A MULTI-CYLINDER INTERNAL-COMBUSTION VEHICLE ENGINE

Uwe Brandt, Bayernstrasse 33, D-5880 Lüdenscheid, Fed. Rep. of Germany

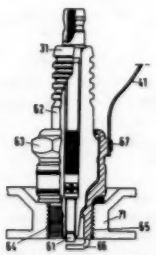
PCT No. PCT/DE89/00706, § 371 Date Sep. 7, 1990, § 102(e) Date Sep. 7, 1990, PCT Pub. No. WO90/07811, PCT Pub. Date Jul. 12, 1990

Continuation of Ser. No. 576,401, Sep. 7, 1990, abandoned. This PCT application Nov. 10, 1989, Ser. No. 799,703

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1989, 3900321

Int. Cl.[5] H01R *13/648*

U.S. Cl. 439—125 **6 Claims**



1. In a ground connection for spark plugs of a multi-cylinder, internal-combustion engine for a vehicle, in which each spark plug has a central electrode electrically connected to a positive pole of a vehicle battery and a metal spark plug casing, the metal spark plug casing of each spark plug including a ground electrode and being screwed into a cylinder head of the engine, the engine being electrically connected with a vehicle ground, and the vehicle ground being electrically connected with a negative pole of the vehicle battery, the improvement comprising:

a plurality of additional ground cables having first and second ends, each first end of the plurality of additional ground cables being electrically connected with the metal spark plug casing of a respective spark plug; and

a common ground cable electrically connected with the negative pole of the vehicle battery and with each second end of the plurality of additional ground cables,

whereby the ignition of the engine is improved.

5,180,314

CONNECTOR FOR SHIELDED PAIR CABLE WITH GROUNDING DRAIN CONDUCTOR

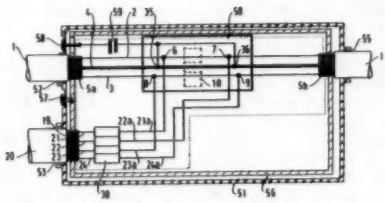
Claude Gelin, Creteil, and Christian Bordino, Bruyeres Le Chatel, both of France, assignors to Cegelec, Levallois Perret, France

Filed Sep. 6, 1991, Ser. No. 756,097

Claims priority, application France, Sep. 7, 1990, 90 11116

Int. Cl.[5] H01R *4/24*

U.S. Cl. 439—394 **6 Claims**



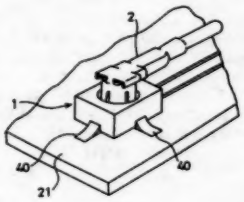
1. Connector for connecting a transmitter and/or receiver using a shielded drop and insert cable comprising two pairs of individually insulated transmission wires to a shielded cable which comprises one pair of individually insulated transmission wires and an electromagnetic shield continuity drain conductor within an electromagnetic shield, said connector comprising a terminal block comprising a support member accommodating a cutting device disposed between four clamp and insulation cutting type connecting members each enabling an individual connection of two insulated wires and each designed to receive one of the four transmission wires of the drop and insert cable and one of the two transmission wires of the cable, the cutting device being movable inside a housing of the support member between a first position allowing two wires to pass between each of the two connecting members, situated to either side of a compartment of the housing, and a second position in which the cutting device is disposed between the connecting members situated to either side of the compartments of the housing, optionally after first cutting the crossing wires, said connector, being accommodated in an insulative material housing and comprising an internal Faraday cage into which the cable conductors extend and accommodating the support member and the connecting members and said shields of said cables being connected so as to form with said cable shields a container protecting against electromagnetic radiation and wherein said cage is connected to two grounding terminals accessible from outside the housing, one directly to said cage and the other via a capacitor.

5,180,315

SURFACE-MOUNTED HIGH-FREQUENCY COAXIAL CONNECTOR

Masayuki Nagashima, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed May 28, 1992, Ser. No. 889,354
Claims priority, application Japan, Jun. 27, 1991, 3-57079[U]
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—581 **2 Claims**



1. A surface-mounted, high-frequency coaxial connector, comprising:

a molding having a fitting cavity, a central column with an aperture, a plurality of openings around said central column;

an outer terminal having a plurality of depending contacts and fitted over said central column such that said depending contacts are press fitted into said openings and that projecting contact portions are bent outwardly to provide ground contacts; and

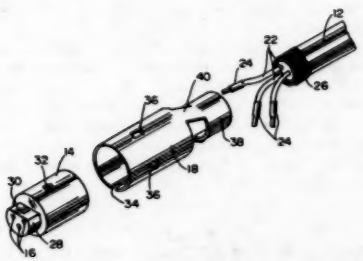
an inner terminal having a central contact inserted into said aperture and a contact leg set on a rear face of said molding to provide a hot contact.

5,180,316

SHIELDED ELECTRICAL CONNECTOR

Robert A. Miller, Yorba Linda, and Donald F. Worden, Orange, both of Calif., assignors to Molex Incorporated, Lisle, Ill.

Continuation of Ser. No. 674,650, Mar. 25, 1991, abandoned.
This application Jan. 16, 1992, Ser. No. 823,027
Int. Cl.[5] H01R *9/03*
U.S. Cl. 439—610 **7 Claims**



1. An electrical connector assembly for a round shielded insulated cable,

said cable having an end with at least one terminated lead extending therefrom and a metal sheath folded back around the outside of said end,

said connector assembly including a generally cylindrical insulating body having a first diameter and at least one terminal-receiving passageway extending therethrough, and a unitary metal shield including a generally cylindrical forward portion adapted to be slidably mounted on and to engage said insulating body and a rear portion extending therefrom adapted to mechanically and electrically engage the metal sheath of said cable, said forward portion including a rear face adjacent said rear portion of the shield and a mating face spaced from said rear face along said forward portion,

the improvement in said connector comprising:

the rear portion of said shield being generally cylindrical and having a second diameter smaller than said first diameter and defining an opening through which the terminated lead is to be inserted prior to being received in the passageway; and

said generally cylindrical insulating body and said shield being configured so as to permit said body to be inserted into said shield only through said mating face,

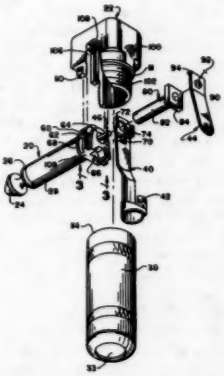
said rear portion being adapted to surround and engage the sheath whereby said rear portion acts as a strain relief for said insulated cable, electrically and mechanically connects the rear portion of said shield to said sheath, and is the sole means for securing the terminated lead in said terminal receiving passageway prior to the overmolding of said electrical connector assembly.

5,180,317

ANGLED ELECTRICAL CONNECTOR

George J. Franks, Jr., 664 Thompson Cir., Inverness, Ill. 60067

Filed Jan. 31, 1992, Ser. No. 829,126
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—669 **17 Claims**



1. An electrical connector, comprising:

an elongated connector assembly having at least one contact surface spaced along an elongated shaft for mating contact with a receptacle, a head portion located adjacent one end of the elongated shaft, and at least one terminal extending from the head portion and electrically connected to the content surface of the elongated shaft,

a shell assembly at least partially surrounding the terminal and including a threaded surface and a slot located in the shell assembly for mounting the head portion to attach the elongated connector assembly to the shell assembly, and

a threaded bushing member for mating engagement with the threaded surface of the shell assembly to form therewith a housing which surrounds the terminal.

5,180,318

FLUIDIC CONNECTOR STRIP WITH BASE PLATE MODULES AND A SOLENOID VALVE FOR EACH MODULE

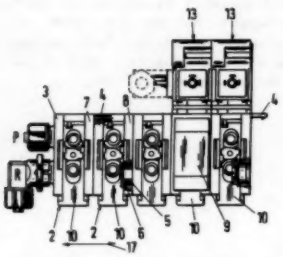
Rudolf Möller, Gehrden; Walter Brausfeld, Hanover; Helmut Göttling, Isernhagen; Gerhard Scharnowski, Gehrden, and Peter Müller, Hanover, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 27, 1991, Ser. No. 721,932

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1990, 4020791

Int. Cl.[5] H01R *9/26*

U.S. Cl. 439—716 21 Claims



1. A fluidic connector module for forming a fluidic connected strip comprising

a base plate module including first base plate module attachment means and second base plate module attachment means;

a solenoid valve including an armature, a coil with coil contacts, first solenoid valve attachment means and second solenoid valve attachment means, with a protective conduit and with a signal line including a coil contact, said solenoid valve being attached with the first solenoid valve attachment means to the first base plate module attachment means of the base plate module;

a first pluggable connector module including

first pluggable connector module attachment means for attaching to the second base plate module attachment means; second pluggable connector module attachment means of the first pluggable connector module with a protective conduit and with a signal line for attachment to the second solenoid valve attachment means of the solenoid valve and with an output having a terminal contact connector to engage the coil contact;

third pluggable connector module attachment means of the first pluggable connector module with a protective conduit and with a signal line for attachment to a fourth pluggable connector module attachment means of a second like pluggable connector module;

fourth pluggable connector module attachment means of the first pluggable connector module with a protective conduit and with a signal line for attachment to a third pluggable connector module attachment means of a third like pluggable connector module,

wherein the third pluggable connector module attachment means of the first pluggable connector module is plug connectable to the fourth pluggable connector module attachment means of the second pluggable connector module, wherein the third pluggable connector module attachment means of the first pluggable connector module and the fourth pluggable connector module attachment means of the first pluggable connector module are disposed such that like pluggable connector modules attached to the third pluggable connector module attachment means of the first pluggable connector module and attached to the fourth pluggable connector module attachment means of the first pluggable connector module have corresponding points of the second pluggable connector module and of the third pluggable connector module disposed on respective parallel straight lines, and wherein the protective conduit and the signal line are through-connected through the first pluggable connector module, the second pluggable connector module, and the third pluggable connector module in an attachment position;

a connector clamp attached to the signal line furnished individually at the connector module for a signal line cable at an input.

5,180,319

JOINT STRUCTURE WITH ELASTIC MOUNT

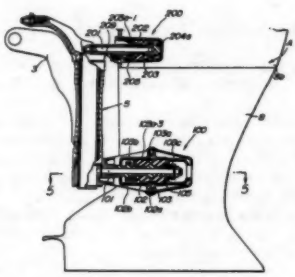
Kazuyuki Shiomi, Saitama; Mitsuharu Tanaka, Tokyo; Kazuomi Kiku, and Akihisa Saito, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1991, Ser. No. 691,644

Claims priority, application Japan, Apr. 25, 1990, 2-109224

Int. Cl.[5] B63H *21/30*

U.S. Cl. 440—52 15 Claims



1. A joint structure for joining an outboard engine assembly to a boat hull, comprising:

an outboard engine assembly having an engine, a case, a propeller rotatably supported on said case and drivable by said engine;

an attachment adapted to be coupled to a boat hull;

said case having an inner surface defining an inner housing region;

elastic mount means accommodated in said inner housing region, for elastically coupling said case to said attachment; and

said elastic mount means comprising a support member coupled to said attachment, and an elastic member disposed on said support member, said elastic member being elastically deformable from partial abutment to full abutment against a portion of said inner surface of said case in response to an increase in compressive forces which are applied between said case and said attachment when said engine is in operation.

5,180,320

TRIM SWITCH FOR TILLER-STEERED OUTBOARD

David C. Calamia; Gregory J. Binversie, both of Grayslake, Ill., and H. Norman Petersen, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

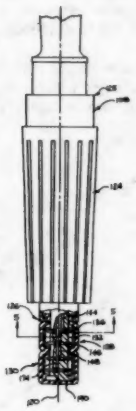
Filed Jun. 18, 1991, Ser. No. 716,912

Int. Cl.[5] B63H *21/26*

U.S. Cl. 440—61 17 Claims

1. A tiller arm for a marine propulsion device, said tiller arm comprising a first end adapted to be connected to a propulsion unit, a second end spaced from said first end, and having a longitudinal axis, and a selectively actuatable switch including annular selectively deformable means located on said tiller arm and surrounding said axis and comprising electrically conductive material, said switch including a first electrical contact,

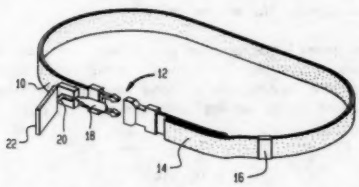
and a second electrical contact spaced from said first contact, deformation of said deformable means resulting in said electrically conductive material of said deformable means electrically connecting said first contact to said second contact.



5,180,321
SWIMMERS'S SAFETY BELT

Dennis Brown, 28 Bayonne Ave., Monmouth Beach, N.J. 07750

Filed Oct. 4, 1991, Ser. No. 771,109
Int. Cl.[5] B63C *9/16*
U.S. Cl. 441—94 6 Claims



1. A swimmer's safety belt comprising:

a substantially hollow belt, closable to fit the waist of a wearer;

a compressed gas cartridge coupled with said belt;

a pin, movable to puncture said cartridge so as to allow said cartridge to fill said belt with compressed gas;

means, movable between first and second positions, to overlie said cartridge and said pin in said first position, for shielding said cartridge and said pin from view, and connected to said pin for moving said pin to puncture said cartridge when moved to said second position;

wherein a portion of said substantially hollow belt fitting the waist of a wearer is adhesively secured in folded, overlapping relationship so as to unfold and expand outwardly under action of the compressed gas which fills it when said means is moved to said second position to puncture said cartridge, thereby increasing the length of the belt in forming a tube to ride upwardly towards the arm level of the wearer;

wherein said means includes a decorative buckle overlying said cartridge and said pin in said first position and connected to said pin;

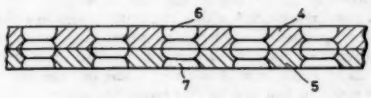
wherein said pin is movable to puncture said cartridge by pulling-open of said buckle to said second position;

wherein said belt is closable by a clasp to fit the waist of a wearer, and wherein said compressed gas cartridge is positioned between said clasp and said buckle which overlies said cartridge and said pin.

5,180,322
MANUFACTURING PROCESS OF SHADOW MASK AND SHADOW MASK PLATE THEREFOR

Toshio Yamamoto, and Koji Sawada, both of Shiga, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Aug. 22, 1991, Ser. No. 748,458
Claims priority, application Japan, Aug. 22, 1990, 2-221964
Int. Cl.[5] H01J *9/14, 29/06*
U.S. Cl. 445—37 54 Claims



1. A process of manufacturing a shadow mask suitable for use in a cathode ray tube, comprising the steps of:

preparing a plurality of metal plates;

forming a plurality of apertures in said metal plates for passing electron beams therethrough;

piling up said plurality of metal plates in close contact in such a manner that said apertures formed in each of said metal plates are arranged in a predetermined positional relation;

annealing said piled up metal plates; and

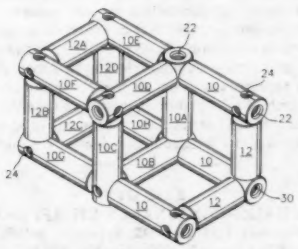
pressing and molding said piled and annealed metal plates into a predetermined curvature, wherein

said metal plates are joined to each other in said annealing step due to surface deviation thereof, and remain joined to each other after said passing and molding step as well as after said shadow mask is assembled as an element of a cathode ray tube.

5,180,323
INTERLOCKING TOY COMPONENTS

Kyle A. Justice, Lake City, Tenn., assignor to Ultimate Manufacturing, Lake City, Tenn.

Filed Oct. 29, 1991, Ser. No. 783,887
Int. Cl.[5] A63H *33/06, 33/08*
U.S. Cl. 446—120 6 Claims



1. Interlocking toy components for the releasable construction of structures defining various geometric configurations, said components comprising:

a first component defining an elongated trunk portion having first and second end portions, and defining a longitudinal axis, said first component including a protruding member coaxial with said longitudinal axis and extending outwardly from said first end portion of said trunk portion in substantially coaxial alignment, said trunk portion of said first component being provided at said second end portion with a substantially coaxial first receptor defining a se-

lected perimeter for releasably receiving said protruding members of other said first components, said trunk portion of said first component also being provided proximate its second end portion with a plurality of further receptors radially spaced about said trunk portion for releasably receiving said protruding members of other said first components, each of said further receptors defining a selected perimeter substantially similar to said selected perimeter defined by said first receptor, said longitudinal axis of said first component and said longitudinal axis of another said first component being substantially fixed in relation to each other when said protruding member of said first component is selectively received in any of said first receptor and said further receptors of said other first component, said protruding member defining an outboard end portion provided with a circumscribing rim defining an outer perimeter which is greater than said perimeters of said receptor and said further receptors so as to provide for forcefit reception of said protruding member into said first receptor and said further receptors; and

a second component defining an elongated trunk portion having first and second end portions, and defining a longitudinal axis, said second component including a second component protruding member mounted upon said front end thereby defining a longitudinal axis and extending outwardly from said first end portion of said trunk portion of said second component in substantially coaxial alignment therewith for being releasably and selectively received in said first receptor and said further receptors of one said first component, said longitudinal axis of said first component and said longitudinal axis of said protruding member being substantially fixed in relation to each other when said second component protruding member is selectively received in any of said first receptor and said further receptors, and said second component including a further protruding member mounted upon said second end along said longitudinal axis and extending outwardly from said second end portion of said trunk portion of said second component in substantially coaxial alignment therewith for being releasably and selectively received in said first receptor and said further receptors of one said first component, said longitudinal axis of said first component and said longitudinal axis of said further protruding member being substantially fixed in relation to each other when said further protruding member is selectively received in any of said first receptor and said further receptors, said protruding member and said further protruding member each defining an outboard end portion provided with a circumscribing rim defining an outer perimeter which is greater than said perimeters of said receptor and said further receptors of said first component so as to provide for force-fit reception of said protruding member and said further protruding member into said first receptor and said further receptors wherein all said receptors are placed to allow each of said first components to receive a plurality of other said first or second components in an orthogonal orientation and a longitudinal orientation simultaneously.

5,180,324

DOLL HAIR MAINTENANCE KIT APPARATUS

Arlene J. Simmons, P.O. Box 612, Syracuse, Ind. 46567-0612

Filed Jun. 12, 1992, Ser. No. 897,416

Int. Cl.[5] A63H *3/36*

U.S. Cl. 446—296 **4 Claims**

1. A doll hair maintenance kit apparatus, comprising,

a brush assembly,

and

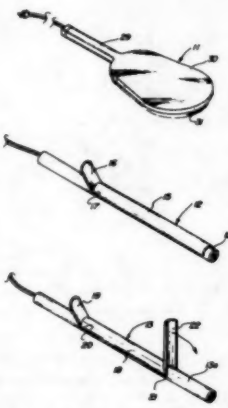
a plurality of curling irons to include a first heated curling iron and a second heated curling iron, the brush assembly includes a handle having a brush body, the brush body including a brush body top wall and a brush body bottom wall, and a matrix of bristles extending through the brush body bottom wall,

and

the first curling iron includes a first curling iron arcuate cover plate, and a first cylindrical body, with the first cover plate including a first spring hinge positioned at a rear distal end of the arcuate plate hingedly mounting the first cover plate to the first cylindrical body,

and

a first handle mounted to the rear distal end of the first cover plate at an oblique angle relative to the first cover plate, the second curling iron including a second curling iron



arcuate cover plate, and a second spring hinge at a rear distal end of the second cover plate, and a second handle fixedly mounted at an oblique angle to the second cover plate adjacent the second spring hinge,

and

a third spring hinge mounted to a forward distal end of the second cover plate, a second arcuate cover extension extending beyond the second cover plate hingedly mounted to the second cover plate at the third spring hinge.

5,180,325

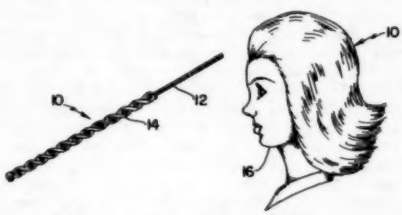
POSEABLE HAIR STRAND FOR TOY DOLL

Fred D. Eddins, Mapleville, R.I., and Maureen Patterson, Wayland, Mass., assignors to Hasbro, Inc., Pawtucket, R.I.

Filed Sep. 4, 1991, Ser. No. 754,959

Int. Cl.[5] A63H *3/44*

U.S. Cl. 446—385 **15 Claims**



1. A poseable hair strand for a toy doll comprising:

a) a core fiber which is ductile and manually formable into various desired set configurations, said core fiber being impregnated with a relatively soft, pliable and formable wax material; and

b) an outer casing on said core fiber, said outer casing comprising a plurality of fibers which substantially cover said

core fiber and which are substantially unimpregnated with said wax material.

5,180,326

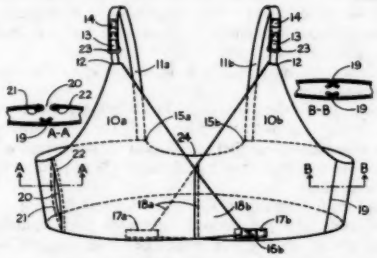
REVERSIBLE MASTECTOMY BRASSIERE

Marguerite R. Williams, 443 W. 44th St., New York, N.Y. 10036

Filed Jan. 26, 1992, Ser. No. 821,577

Int. Cl.[5] A41C *3/00, 3/02*

U.S. Cl. 450—91 **10 Claims**



1. A reversible mastectomy brassiere to be worn on the left or right breasts of a mastectomy patient composed of two separate but almost identical brassiere forms each form having two cups, said forms are sewn together to form one complete brassiere in such manner as to permit said complete brassiere to be turned inside-out through an open side seam located on one side of one of the two almost identical brassiere forms, resulting therewith in one mastectomy brassiere having a smooth appearance with no visible seams showing, whether said brassiere is worn with one side appearing to view or reversed so another side appearing to view, said open side seam of said reversible brassiere also providing means for the insertion in various positions of a prosthesis which may be positioned on said left breast, or when said brassiere is completely reversed to position said prosthesis on said right breast of said mastectomy patient, adjustable attaching means being provided on bottom front elements of each cup for front closing of said mastectomy brassiere in variable positions.

5,180,327

APPARATUS FOR MANUFACTURING SAUSAGES OF THE LIKE

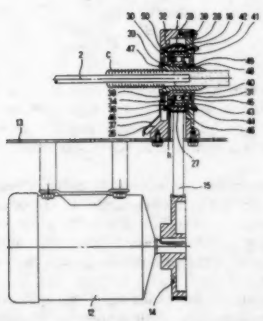
Minoru Kasai, Ebina, and Minoru Nakamura, Tokyo, both of Japan, assignors to Hitec Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1991, Ser. No. 753,061

Claims priority, application Japan, Apr. 27, 1989, 1-108175; Oct. 26, 1990, 2-290160

Int. Cl.[5] A27C *11/00*

U.S. Cl. 452—47 **10 Claims**



1. An apparatus for manufacturing sausages or the like including a nozzle for stuffing a material such as a meat emulsion into a casing for sausages or the like, a pump for supplying the material into said nozzle, and a braking member having a portion for engaging with an unstuffed portion of the casing and adapted to rotate while braking the casing, said apparatus comprising:

a device for driving said braking member, said device including a housing, a rotary member accommodated rotatably inside said housing and adapted to rotate said braking member with said braking member fixed therein, a bearing for rotatably supporting said rotary member, sealing means for preventing the entrance of a foreign substance such as the material into said bearing, and rotation transmitting means for driving said rotary member, said bearing having a sealing member for sealing a lubricant for said bearing in said bearing, wherein a space for discharging the foreign substance which has entered between said sealing means and said bearing to outside said housing is provided in said housing.

5,180,328

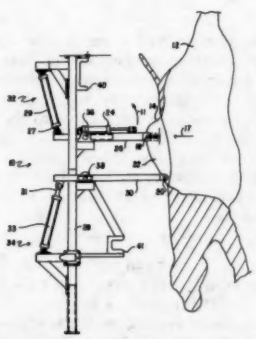
METHOD AND APPARATUS FOR REMOVING A HIDE FROM A BACK PORTION AND TAIL OF A CARCASS

Albert D. Davis, Greeley, Colo., assignor to Monfort, Inc., Greeley, Colo.

Filed May 3, 1991, Ser. No. 695,266

Int. Cl.[5] A22B *5/16*

U.S. Cl. 452—128 **27 Claims**



1. An apparatus for removing a hide from a back portion and tail of an animal carcass, comprising:

first and second elongated members pivotally mounted on a frame, said members positioned to enter a gap between the hide and the carcass near a small of the carcass' back; and

means for moving said first member towards the tail and said second member towards a neck of the carcass, wherein the hide is peeled from the carcass.

5,180,329

AUTOMATIC FOOT AND HOOF SHEAR

Philip G. Meyer, Plainview, Tex., assignor to Jarvis Products Corporation, Middletown, Conn.

Filed Sep. 13, 1991, Ser. No. 759,456

Int. Cl.[5] A22C *17/02*

U.S. Cl. 452—166 **23 Claims**

1. An automatic hoof shearing device comprising:

a base adapted for mounting near a carcass rail;

a frame movably mounted on the base;

a frame driver connected between the frame and the base for moving the frame relative to the base;

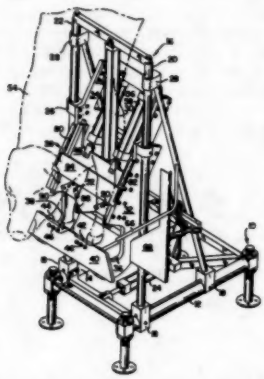
a shearing assembly movably mounted on the frame, the shearing assembly including at least one shearing blade movable in a shearing plane between an open and a closed

shearing position, the shearing assembly defining a shearing region;

a shearing assembly driver connected between the shearing assembly and the frame for moving the shearing assembly relative to the frame;

a carcass position sensor producing a signal indicating the presence of a carcass with a hoof in the shearing region;

a hoof position sensing assembly producing a signal indicating the position of a hoof on a carcass approaching the shearing region;



a control system connected to receive the signal from the hoof position sensing assembly and connected to control the frame driver and shearing assembly driver to move the frame and shearing assembly and position the cutting plane to a desired location relative to the hoof on the carcass; and

a shearing blade driver responsively connected to the carcass position sensor for moving the shearing assembly from the open to the closed position to shear the hoof from the carcass.

5,180,330

APPARATUS FOR GENERATING AT LEAST ONE JET OF GASEOUS FLUID

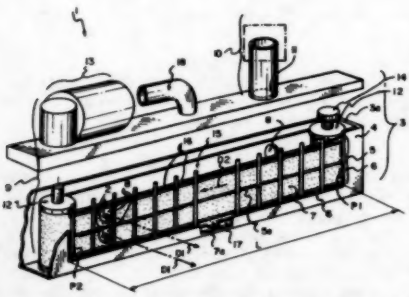
Delepierre, Bertrand, 65 rue de Lille, 59420 Mouvaux, and Louis Coupleux, 12 rue de Verdun, 80380 Villers Bretonneux, both of France

Filed Jun. 17, 1991, Ser. No. 715,979

Claims priority, application France, Jun. 18, 1990, 90 07892

Int. Cl.[5] F24F *7/00*

U.S. Cl. 454—64 **10 Claims**



1. A blower apparatus (1) for generating at least one jet (2) of gaseous fluid oriented in one direction (D1) said jet also being movable in a direction (D2) substantially perpendicular to the orientation direction (D1),

said blower apparatus having means for moving said at least one jet of fluid at least between two positions (P1, P2), the distance between which is approximately equal to a longitudinal dimension (L) of the blower apparatus;

the blower apparatus further comprising:

a hollow box (3), of a rectangular parallelepiped shape having rigid walls (3*a*), the box having at least one longitudinal face (4) including at least one window (5) which extends over approximately an entire longitudinal dimension of said face, said window comprising at least one cutout made through an entire thickness of a wall forming said longitudinal face, and

the means for moving said at least one jet of fluid further comprising:

at least one flexible belt (7), which sealingly closes said at least one window (5), said belt being vertically disposed in a substantially parallel orientation to said window, said belt having at least one perforation (8) of predetermined dimensions,

means (9) for driving said at least one belt (7) along a plane parallel to a longitudinal extent of said window (5) thereby displacing said at least one perforation of said at least one belt along the longitudinal dimension of the window, and

means (10) for injecting gaseous fluid into said box (3) through an opening (11) made in one of its walls, said injecting means injecting said gaseous fluid at a side of said belt opposite a side of said belt facing said window, thereby causing said gaseous fluid to be emitted out of said box as said jet of gaseous fluid.

5,180,331

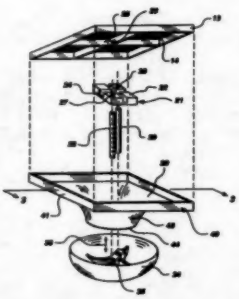
SUBFLOOR DAMPER AND SPILL CONTAINER

Terry L. Daw; David F. Procter, both of Salt Lake City, and Kevin D. Moss, Bountiful, all of Utah, assignors to Daw Technologies, Inc., Salt Lake City, Utah

Filed Feb. 1, 1990, Ser. No. 473,393

Int. Cl.[5] F24F *13/10*

U.S. Cl. 454—187 **12 Claims**



1. A device attachable to a suspended floor member (i) for collecting materials which fall through grid openings in the floor member and (ii) for controlling the rate of air-flow through the grid openings in an adjustable manner, said device comprising:

1.1 a spill container approximately dimensioned to be positioned under the grid openings of the floor member with a collecting area of sufficient breadth and configuration to collect and retain all liquids and particulate materials passing through the grid openings into the volume of the container;

1.2 support means for positioning the spill container in a coordinated position with respect to the grid openings under the floor member, said coordinated position provid-

ing (i) a venting path for permitting air flow past the spill container from above the floor member, and (ii) means for collecting and retaining all liquid and particulate matter falling through the grid openings; and

1.3 adjustable control means coupled to the spill container for regulating the rate of air flow passing through the venting path to thereby control the rate of air flow through the floor member.

5,180,332

AIR CIRCULATION SYSTEM

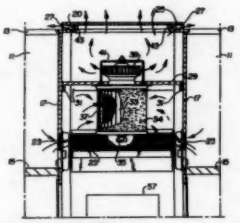
George E. Mitchell, Rosemont, and Michael H. Pelosi, III, Downingtown, both of Pa., assignors to Centercore, Inc., Wayne, Pa.

Continuation-in-part of Ser. No. 536,179, Jun. 11, 1990, Pat. No. 5,065,668. This application Jun. 5, 1991, Ser. No. 710,799

The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.

Int. Cl.[5] F24F *7/06*

U.S. Cl. 454—230 **18 Claims**



1. A work station array including at least one workspace defined in part by side walls, comprising:

an enclosed core associated with said work station array and including air inlet means for drawing air into said core at or below a predetermined height and having means for circulating and filtering air through said core; and

air discharge means at the upper end of said core for discharging air solely in a predetermined common plane out from said core and at a distance above said height to cooperatively form an envelope of filtered air surrounding a space defined (i) in part by said side walls and said core wall, and (ii) in part by air flow out of said air discharge means and into said air inlet means, whereby an individual in said workspace is enclosed in filtered air.

5,180,333

VENTILATION DEVICE ADJUSTED AND CONTROLLED AUTOMATICALLY WITH MOVEMENT OF HUMAN BODY

Jia-Ming Shyu, Hsinchu, Taiwan, assignor to Norm Pacific Automation Corp., Hsinchu Hsien, Taiwan

Filed Oct. 28, 1991, Ser. No. 783,159

Int. Cl.[5] F24F *13/10*

U.S. Cl. 454—319 **20 Claims**

1. A ventilation device, capable of adjusting and controlling itself automatically by detection of movement of a human body in a ventilating area comprising:

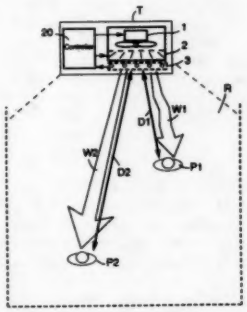
means for generating air to be discharged;

means for controlling the operation of said air generating means;

means for sensing the presence and location of said human body in said ventilating area and for generating signals in response to said presence and location; and

input means for a user to input ventilation requirements of at least the direction of discharging air relative to the physical position of said user;

said controlling means responsive to the signals from said sensing means and the user input for discharging air to said



user only when said user is detected in said ventilating area.

5,180,334

TORQUE VARIATION ABSORBING DEVICE PROVIDED WITH ELASTIC ELEMENTS AND GROOVED PLATES FOR RECEIVING ROTATIONAL ELEMENTS

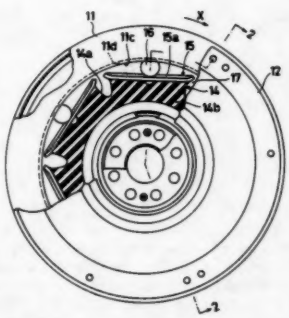
Mototaka Nakane, Toyota, and Kiyonori Kobayashi, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 21, 1991, Ser. No. 748,259

Claims priority, application Japan, Aug. 31, 1990, 2-228339

Int. Cl.[5] F16D *3/14, 3/76, 7/06*

U.S. Cl. 464—35 **6 Claims**



1. A torque variation absorbing device, comprising:

a driving plate;

a flywheel;

bearing means positioned between a hub of the driving plate and a hub of the flywheel for rotatably supporting the flywheel so that the flywheel is rotatable relative to said driving plate about an axis that is common to said driving plate and said flywheel;

an elastic member disposed in a space defined between said driving plate and said flywheel, a radially inner peripheral portion of said elastic member being secured to one of said driving plate or said flywheel, and a radially outer peripheral surface of said elastic member facing an inner peripheral surface of the other of said driving plate and said flywheel;

a receiving plate secured to an outer peripheral surface of said elastic member so as to face said inner peripheral surface, said receiving plate having two oppositely posi-

tioned ends that are spaced apart from one another in the circumferential direction of the receiving plate;

a plurality of rotational members rotatably disposed between said receiving plate and said inner peripheral surface in the circumferential direction, said rotational member being acted upon by the elastic force of said elastic member; and

a clearance defined between said receiving plate and said inner peripheral surface, said clearance narrowing towards said oppositely positioned ends of the receiving plate from a center of said receiving plate, said elastic member being received in said clearance.

5,180,335

TORSION DAMPING ASSEMBLY FOR USE WITH CLUTCHES IN MOTOR VEHICLES

Paul Maucher, Sasbach, and Oswald Friedmann, Lichtenau, both of Fed. Rep. of Germany, assignors to Luk Lamellen Und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

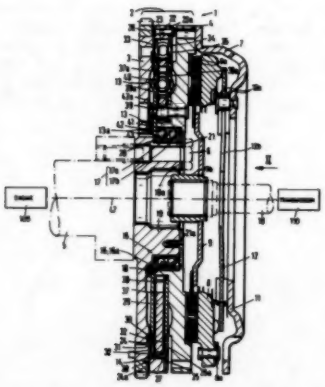
Continuation of Ser. No. 717,327, Mar. 29, 1985, abandoned. This application Oct. 11, 1988, Ser. No. 256,236

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1984, 3421698; Jul. 7, 1984, 3425159

The portion of the term of this patent subsequent to Jun. 9, 2009, has been disclaimed.

Int. Cl.[5] F16D *3/14*; **F16F** *15/10*

U.S. Cl. 464—68 **82 Claims**



1. A torsion damping assembly for taking up and compensating for fluctuations of torque which is transmitted between the internal combustion engine and the clutch in a motor vehicle, comprising a plurality of flywheels including a first flywheel arranged to receive torque for the engine and a coaxial second flywheel arranged to transmit torque to the clutch, said first and second flywheels being rotatable relative to each other; first and second damper means interposed between and arranged to yieldably oppose angular movements of said first and second flywheels relative to each other, said first and second damper means respectively comprising a first and a second pair of discs which are spaced apart from each other in the axial direction of said first and second flywheels, the discs of said first pair being distinct from said flywheels and being arranged to share the angular movements of one of said first and second flywheels and the discs of said second pair being distinct from said flywheels and being arranged to share the angular movements of the other of said fist and second flywheels, the discs of one of said pairs being disposed at least in part inwardly of the discs of the other of said pairs in the radial direction of said first and second flywheels; and means for connecting said first and second damper means in series, comprising a disc-shaped torque transmitting component disposed axially between the discs of said first and second pairs, said component being turnable with reference to each of said first and second flywheels and said first damper means further comprising first energy storing means interposed between said component and said one flywheel by way of the discs of said first pair, said second damper means further comprising second energy storing means interposed between said component and said other flywheel by way of the discs of said second pair.

5,180,336

OLDHAM COUPLING

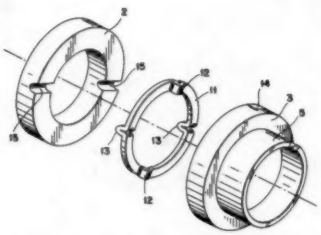
Kurt Güttinger, Murten, Switzerland, assignor to Gutag Innovations AG, Murten, Switzerland

Continuation of Ser. No. 409,326, Sep. 19, 1989, abandoned. This application Jan. 15, 1991, Ser. No. 642,699

Claims priority, application Switzerland, Sep. 20, 1988, 03491/88

Int. Cl.[5] F16D *3/04*

U.S. Cl. 464—102 **2 Claims**



1. An Oldham coupling to connect parallel structural parts, comprising:

an intermediate ring having planar surfaces and being freely movable between planar surfaces of hubs of said structural parts to be connected;

lands located at 90 degrees relative to each other on the planar surfaces of the intermediate ring, said lands having friction surfaces;

said planar surfaces of said hubs having grooves with load bearing walls, said grooves corresponding to said lands;

said lands adapted to slidably engage the corresponding grooves of the hubs;

said lands being semi-cylindrical on their friction surfaces and the load bearing walls of the grooves being correspondingly semi-cylindrical to hold said lands for slidable engagement therein, the central axis of the semi-cylindrical friction surfaces extending radially of the intermediate ring; and

said grooves each having a recess for reducing frictional wear between said lands and said grooves during operation of said coupling, said recess disposed at the bottom of each of said grooves and extending axially of the groove such that contact between the grooves and the lands is substantially prevented at the bottom of said semi-cylindrical grooves.

5,180,337

KITTY LITTER NOVELTY FIGURE

Eric Rein, 1327 Soria Glen, Escondido, Calif. 92026

Filed Nov. 15, 1991, Ser. No. 792,905

Int. Cl.[5] A63J *5/00*

U.S. Cl. 472—57 **4 Claims**

1. A novelty item producing the impression of a cat trapped in a bag comprising;

(a) a bag;

(b) said bag being substantially completely enclosed; and,

(c) a simulated cat tail attached to and extending from a portion of said bag such that the novelty item produces

the visual impression that a cat has been captured in said bag such that only its tail protrudes.

5,180,338

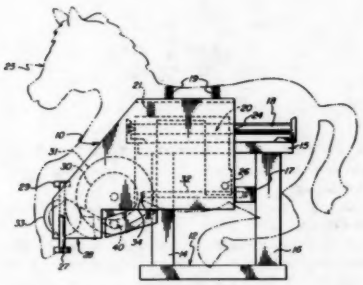
RIDING TOY MECHANISM

Albert A. Pinto, 15 Branford Ct., Avon, Conn. 06001

Continuation-in-part of Ser. No. 573,367, Aug. 27, 1990, abandoned. This application Apr. 15, 1992, Ser. No. 869,240

Int. Cl.[5] A63G *17/00*

U.S. Cl. 472—96 **18 Claims**



1. A riding mechanism comprising:

a stationary support means;

a slide member slidably mounted on the mechanism;

a pivot member pivotably mounted on the mechanism;

dual reciprocating means, engaged with power means defined below, for simultaneously imparting lateral reciprocating motion to at least the slide member and independently imparting vertical pivoting motion to at least the pivot member, thereby imparting a compound motion to one of the slide member and the pivot member in which the amplitude of the vertical pivoting motion is independent from the amplitude of the lateral reciprocating motion; and

power means mounted on the mechanism and engaged with the dual reciprocating means, for operating the mechanism.

5,180,339

DOUBLE ACTING SECONDARY SHEAVE SERVO FOR A CONTINUOUSLY VARIABLE TRANSMISSION

William J. Haley, Ithaca, and Glenn E. Swanson, Lansing, both of N.Y., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Division of Ser. No. 721,285, Jun. 26, 1991. This application Aug. 22, 1991, Ser. No. 748,695

Int. Cl.[5] F16H *59/00*

U.S. Cl. 474—28 **8 Claims**

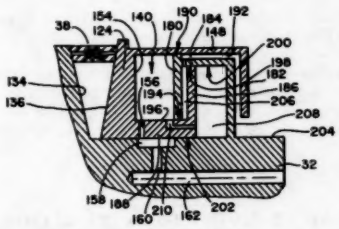
1. A continuously variable transmission system to provide transmission of torque from a torque input means to a torque output means, comprising:

rotatable input and output shafts;

drive means for drivingly coupling said input shaft with said output shaft, said drive means including a first variable pulley rotatable with said input shaft, a second variable pulley rotatable with said output shaft, and a belt means coupling said first and second variable pulleys, each of said first and second variable pulleys having a fixed sheave and a movable sheave;

first biasing means for continuously biasing together said fixed and movable sheaves of said first variable pulley, second biasing means for continuously biasing together said fixed and movable sheaves of said second variable pulley; and

said second biasing means including a plurality of fluid chambers having fluid access to a source of pressurized



hydraulic fluid, said plurality of fluid chambers including first, second and third fluid chambers, said first chamber being in fluid communication with said hydraulic fluid source, addition and exhaustion of fluid from said fluid chambers being effective to cause relative movement of said movable sheaves,

said movable sheave of said second variable pulley being operatively positioned for movement from a first position to said second position corresponding to movement from a position proximate to a position distal from said fixed sheave of said second variable pulley,

said movable sheave of said second variable pulley including a first fluid conduit, positioning of said movable sheave in said first position being effective to permit communication of fluid between said first fluid chamber and said third fluid chamber through said first fluid conduit.

5,180,340

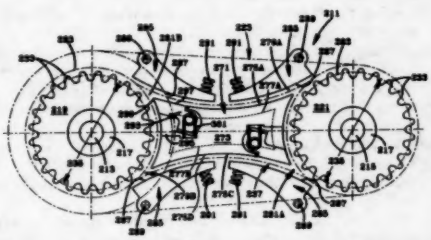
GUIDE MECHANISM FOR A TRAVELING CHAIN TRANSMISSION

Hamid Vahabzadeh, Oakland, and Erkki A. Koivunen, Livonia, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 786,148, Oct. 31, 1991. This application Dec. 16, 1991, Ser. No. 808,245

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—111 **3 Claims**



1. A torque transmission system for operatively connecting

laterally spaced driving and driven shaft means, said system comprising:

a sprocket mounted on each said shaft;

each said sprocket having radially extending teeth located along the circumference thereof;

an endless flexible chain which cooperatively interacts with said teeth on said sprockets;

a traveling chain adapted cooperatively to interact with said teeth on either of said sprockets and having cogs which cooperatively interact with the endless flexible chain along that portion of said traveling chain which engages the teeth on either said sprocket;

said traveling chain having a leading end and a trailing end which define the length of said traveling chain such that it will substantially circumscribe either of said sprockets;

derailing and locking means being provided for selectively disengaging the leading end of said traveling chain from whichever of said sprockets is circumscribed by said traveling chain during driving movement of said endless chain for permitting transfer of the traveling chain between the sprockets; and

guide means disposed between the sprockets for guiding said traveling chain during transfer from one sprocket to the other sprocket and being self-adjusting to accommodate a variable path length over which the traveling chain traverses.

5,180,341

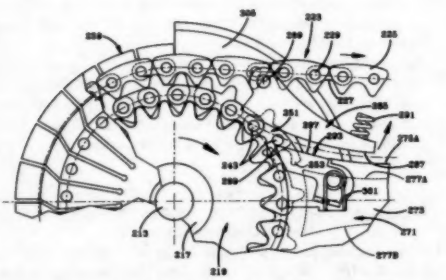
DERAILING MECHANISM FOR A TRAVELING CHAIN TRANSMISSION

Hamid Vahabzadeh, Oakland, and Erkki A. Koivunen, Livonia, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 786,148, Oct. 31, 1991. This application Dec. 16, 1991, Ser. No. 808,246

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—111 **3 Claims**



1. A torque transmission system for operatively connecting laterally spaced driving and driven shaft means, said system comprising:

a sprocket mounted on each said shaft;

each said sprocket having radially extending teeth located along the circumference thereof;

an endless flexible chain which cooperatively interacts with said teeth on said sprockets;

a traveling chain adapted cooperatively to interact with said teeth on either of said sprockets and having cogs which cooperatively interact with the endless flexible chain along that portion of said traveling chain which engages the teeth on either said sprocket;

said traveling chain having a leading end and a trailing end which define the length of said traveling chain such that it will substantially circumscribe either of said sprockets; and

derailing and locking means being provided for selectively disengaging the leading end of said traveling chain from whichever of said sprockets is circumscribed by said traveling chain during driving movement of said endless chain comprising;

a resilient disk means secured to at least one side of each said sprocket, said resilient disk means being divided radially into a plurality of radial segments, an aperture in each said segment and at least one reaction pin in proximity to the leading end of said traveling chain, said reaction pin adapted to be received in one of said apertures when the leading end of said traveling chain penetrates between said endless chain and one of said sprockets.

5,180,342

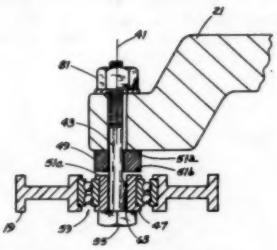
DEVICE FOR MAINTAINING BELT ALIGNMENT

Marvin D. Van Ee, Eldridge, Iowa, assignor to Case Corporation, Racine, Wis.

Filed Jan. 14, 1991, Ser. No. 641,171

Int. Cl.[5] F16H *7/22*

U.S. Cl. 474—123 **17 Claims**



1. An improved device for maintaining alignment of a belt passing over a idler pulley and driven by a driving pulley, such device including:

a support shaft mounted on an arm and having an axis with a fixed locus;

a collar mounted generally concentric with the shaft and supporting an idler pulley having an axis of rotation intersecting the shaft axis at an angle;

an indexing plate mounted generally concentric with the shaft for maintaining a selected position of the collar;

an indexing surface in position-affecting relationship to the collar and defining a plane oriented at an angle with respect to the support shaft axis;

the plate and the collar each being rotationally positionable with respect to the arm and the angle of intersection of the shaft and pulley axes being a function of the relative rotational positions of the plate, the collar, and the arm whereby the locus of the axis of rotation of the idler pulley may be selected to maintain alignment of the belt with the driving pulley.

5,180,343

PULLEY GUARD APPARATUS

Michael A. Reed, 5291 W. Garrison Rd., Laingsburg, Mich. 48848

Filed Dec. 16, 1991, Ser. No. 808,536

Int. Cl.[5] F16H *57/02*

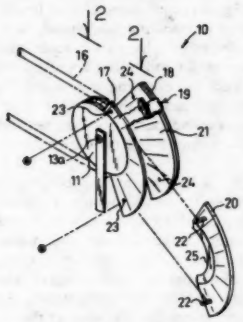
U.S. Cl. 474—144 **7 Claims**

1. A pulley guard apparatus, comprising,

a pulley wheel, the pulley wheel including a pulley groove circumferentially directed about the wheel, including a first annular side flange and a second annular side flange spaced relative to one another on opposed sides of the groove, and

a first frameplate mounted to a first side of the pulley wheel, and a second frameplate mounted to a second side of the pulley wheel, with a first frameplate flange disc mounted to the first frameplate extending beyond the first side flange, and a second frameplate flange disc mounted to the

second frameplate extending beyond the second side flange mounted to the second side flange, wherein a first frameplate flange disc and a second frameplate flange disc define an obtuse angle therebetween and includes a first frameplate flange disc interior surface and a second frameplate flange disc interior surface in confrontation relative to one another, and



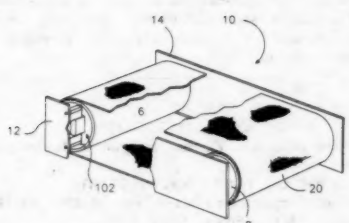
a first arcuate insert disc contiguously and coextensively mounted to the first frameplate flange disc interior surface, and a second arcuate insert disc in contiguous and coextensive relationship relative to the second frameplate flange disc interior surface.

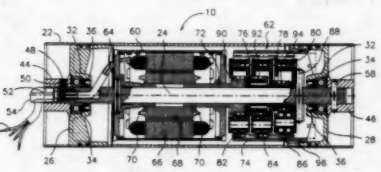
5,180,344

MOTORIZED PULLEY WITH INTERNAL MOUNTS

David V. Hall, Wilmington, N.C., assignor to Interroll Holding A.G., San Antonio, Switzerland

Filed Mar. 23, 1992, Ser. No. 856,376
Int. Cl.[5] F16H *7/00*
U.S. Cl. 474—148 **10 Claims**





1. A drive pulley assembly comprising:

(a) a stationary shaft;

(b) a generally cylindrical drum having two open ends mounted on the stationary shaft for rotation around the axis of the shaft;

(c) drive means mounted on the stationary shaft and disposed inside the cylindrical drum for rotating the drum around the stationary shaft; and

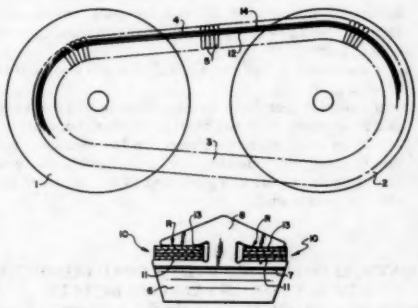
(d) a pair of mounting brackets for mounting the drive pulley assembly between a pair of parallel frame members, said mounting brackets being so sized and shaped to fit inside the open ends of the drum such that a substantial majority of the mounting bracket is contained inside the ends of the drum when the drum is mounted between the frame members.

5,180,345

DRIVING BELT PROVIDED WITH TRANSVERSE ELEMENTS AND TRANSVERSE ELEMENTS FOR SUCH DRIVING BELT

Cornelis P. Van der Zande, Heeze, Netherlands, assignor to Van Doorne's Transmissie, B.V., Tilburg, Netherlands

Filed Nov. 9, 1983, Ser. No. 550,203
Claims priority, application Netherlands, Nov. 12, 1982, 8204379
The portion of the term of this patent subsequent to Dec. 19, 2003, has been disclaimed.
Int. Cl.[5] F16G *5/00*
U.S. Cl. 474—201 **6 Claims**



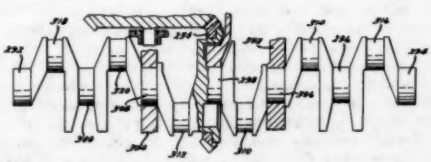
1. Driving belt of substantially trapezoidal cross section for application on V-shaped pulleys comprising an endless carrier having an inner side and an outer side and including at least one endless strip-like band and a plurality of transverse elements slidably arranged on said carrier, each transverse element having at least one slot for receiving the carrier, said slot bordered by a contact surface for contacting the inner side of the carrier and a contact surface for contacting the outer side of the carrier, characterized in that the contact surface for contacting the outer side of the carrier is convexly curved in the transverse direction in respect of the carrier.

5,180,346

T-DRIVE POWERTRAIN ASSEMBLY FOR AUTOMOTIVE VEHICLE WITH FORWARD DISPOSITION OF THE AXIS FOR THE FORWARD TRACTION WHEELS

Donald L. Carriere, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 22, 1991, Ser. No. 733,949
Int. Cl.[5] B60K *5/04, 17/00*
U.S. Cl. 475—200 **18 Claims**



1. A T-drive vehicle powertrain assembly comprising an internal combustion engine with a crankshaft, a drive gear

connected to and rotatable in unison with said crankshaft about the axis of the cranks haft at a location intermediate the crankshaft ends;

a power transmission mechanism comprisinga hydrokinetic torque converter with an impeller and a turbine in fluid flow relationship and a gear system having a power input shaft mounted on an axis substantially perpendicular to said crankshaft axis, a power output shaft of said transmission being adapted to be connected to vehicle traction wheels;

said crankshaft having multiple crank portions, said drive gear being mounted on one axial side of one of said crank portions, said driven gear being mounted for rotation in the plane of motion of said one crank portion with its axis of rotation transversely disposed with respect to said crankshaft axis, the pitch diameter of said drive gear being larger than the radial extent of the path of movement of said one crank portion whereby interference between said driven gear and said one crank portion is avoided;

a driven gear connected drivably to said impeller and meshing with said drive gear whereby said engine and said transmission mechanism form a compact, unitary drive assembly, said power input shaft being connected drivably to said turbine;

said transmission power output shaft extending toward said driving gear; and

a final transaxle gear drive located between said engine and said torque converter and having differential gearing with axle drive gears, a geared connection between said power output shaft and separate ones of said axle drive gears, each axle drive gear being adapted to be connected drivably to an axle shaft.

5,180,347

CONTROLLING DEVICE WITH A ROAD CONDITION DISPLAY FOR AN EXERCISE BICYCLE

Hsi-Lin Chen, No. 171, Wuchuan Wu St., Taichung, Taiwan

Filed Jul. 3, 1991, Ser. No. 725,424
Int. Cl.[5] A63B *21/00*; G09B *9/04*
U.S. Cl. 482—5 **6 Claims**

1. A controlling device with a road condition display for an exercise bicycle comprising:

a frictional load means comprising a motor, a gear set, a first cable, a sliding piece, a second cable, a tension belt, and a resistance wheel for generating various resistances said motor is engaged to said gear set, said gear set is connected to said first cable, said first cable is connected to said sliding piece, said sliding piece is engaged to said second cable, said second cable is engaged to said resistance wheel, said motor actuating said gear set, tightening or slackening said first cable, said sliding piece, and said second cable when said motor is electrically triggered by said driving means, thereby said resistance wheel experiences increased or decreased resistance respectively;

a picture means for providing a motion picture of different road conditions, having an indicator being displayed together with the motion picture and flashing at different frequencies in accordance with different road conditions; said indicator flashing in a signal-output period and not flashing in an idle period; said signal-output period and said idle period constituting a task cycle;

a sensing means disposed in front of said indicator for detecting the flashing frequencies thereof and sending out pulses to a first rectifier circuit; said first rectifier circuit rectifying pulses from said sensing means to square pulses and coupling said square pulses to a first counter means; said first counter means counting up or down for each pulse during a signal-output period, and holding a counting output during a following idle period; said counting output being further coupled to a comparator;

a second counter for indicating a present magnitude of a frictional load by updating a counted output thereof, whereby the tightness of the frictional load is represented by a corresponding output of said second counter, and said counted output being further coupled to a comparator;

a comparator for comparing the outputs from said first counter and said second counter and sending out a first output for controlling said motor to forwardly rotate, a second output for controlling said motor to reversely rotate, and a fourth output and a fifth output for controlling the second counter to count up or down;

a timing means electrically connected to said first counter and said comparator for cooperating therewith and resetting said first counter and said comparator at a first pulse of every task cycle, so that said first counter counts to a new value every task cycle and said comparator compares counted values from said first counter and said second counter;

a driving circuit electrically coupled to the first output and the second output of said comparator and to said frictional load means to drive the motor to rotate either forwardly or reversely;

a pulse generator electrically engaged to said frictional load means for generating at least one pulse in response to a changing resistance of said frictional load means;

a second rectifier electrically connected to said pulse generator for rectifying the pulse therefrom to a square pulse; and

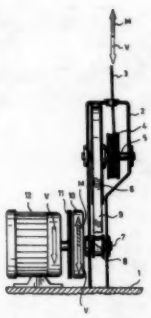
an up-down controlling means electrically connected to said second rectifier, said comparator, and said second counter, respectively, for setting said second counter to count up or down.

5,180,348

RESISTANCE MECHANISM

Sulevi Saarinen, Ilmarinen, Finland, assignor to Tunturipyora Oy, Finland

Filed Aug. 9, 1991, Ser. No. 743,014
Claims priority, application Finland, Aug. 23, 1990, 904185
Int. Cl.[5] A63B *21/005, 22/06*
U.S. Cl. 482—6 **7 Claims**



1. Resistance mechanism for an exercise device, comprising

operating means by means of which the user loads the resistance mechanism; a first part rotating with the movement created by the operating means and a second part positioned at a distance from the rotating part, one of said first and second parts being provided with permanent magnets to create eddy currents resisting the movement of the operating means and the other of said first and second parts having an element acting on the rotating first part, said element comprising a plate of metal material which is arranged to be rotated by means of a separate power source at a speed independent of the speed of rotation of the rotating first part rotated by the operating means.

5,180,349

SIMULATED TIGHTROPE WALKING APPARATUS

Richard E. Marcus, 1012 King St., Olean, N.Y. 14760

Filed Jul. 10, 1991, Ser. No. 728,091

Int. Cl.[5] A63B *7/08*

U.S. Cl. 482—34 **8 Claims**

1. Tightrope simulating apparatus which deflects in response to the weight and movement of a person walking thereon in a manner simulative of a tightrope, said apparatus comprising:

a flexible beam comprising a first elongate circular cylindrical tube having a predetermined inside diameter and a second elongate circular cylindrical tube loosely fitted within said first tube, and

first and second support means for supporting said beam above and substantially parallel to a horizontal support surface, at least one of said support means being movable relative to the other to respective spaced apart positions along the length of said beam for adjusting the stiffness of the supported beam, the amount of deflection of said beam in response to a given weight applied to a point on said beam between said support means increasing with increased spacing between said support means.

5,180,350

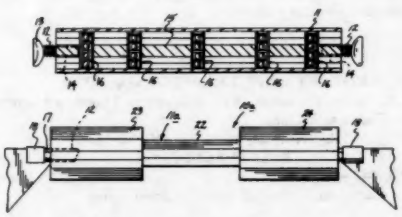
EXERCISE BAR APPARATUS

David D. Thomas, 34 Lakeview Ave., Holbrook, Mass. 02343-1202

Filed Feb. 19, 1991, Ser. No. 657,406

Int. Cl.[5] A63J *1/00*

U.S. Cl. 482—40 **1 Claim**



1. An exercise bar apparatus, comprising,

an elongate, coaxially aligned polygonal body defined by adjacent flats coextensive with the polygonal body, the polygonal body including a central support rod coextensively directed through the polygonal body, wherein the support rod includes an internally threaded socket formed at each terminal end of the central support rod, each internally threaded socket includes an externally threaded rod mounted thereon, and each externally threaded rod includes a polymeric cap mounted thereon, and

a plurality of equally spaced caged roller bearings positioned within the polygonal body mounted between the polygonal body and the central support rod rotatably mounting the polygonal body to the central support rod, and

a support cup mounted relative to each cap for receiving the cap therewithin, and each support cup is orthogonally and integrally mounted to a support flange, wherein each support flange is adapted for mounting to a vertical interior surface of a door frame, and

wherein the polygonal body further includes a central polygonal body portion defined by a first diameter, the central polygonal body portion including a respective first and second polygonal body extremity portion mounted at each terminal end of the central polygonal body, wherein the first and second polygonal body extremity portions are coaxially aligned with the central polygonal body, and the central polygonal body is defined by a first diameter, the first and second polygonal body extremity portions are defined by a second diameter, wherein the second diameter is greater than the first diameter to accommodate an individual of an enlarged hand grasp for securement to the first and second polygonal body extremity portions, and wherein an individual of a reduced hand grasp is accommodated upon the central polygonal body portion.

5,180,351

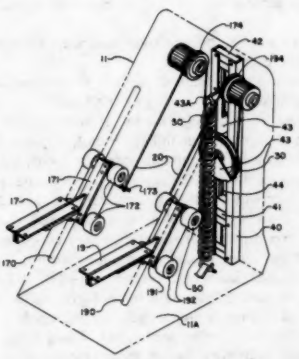
SIMULATED STAIR CLIMBING EXERCISE APPARATUS HAVING VARIABLE SENSORY FEEDBACK

Ted H. Ehrenfried, Portsmouth, Va., assignor to Alpine Life Sports, Suffolk, Va.

Filed Oct. 21, 1991, Ser. No. 767,692

Int. Cl.[5] A63B *22/04*

U.S. Cl. 482—52 **7 Claims**



1. An exercise apparatus for simulating a stair climbing exercise and for providing an operator with two stepping modes and a varying amount of sensory feedback to a lifting foot of the operator, comprising:

a base;

a frame extending from said base for providing the operator a means for balancing his upper body when performing the stair-climbing exercise;

left and right foot mechanisms housed within said base and having left and right foot support steps, each of said foot support steps extending from said base and being capable of substantially vertical upward and downward strokes, wherein the operator places his left foot and right foot on

said left and right foot support steps, respectively, and wherein the left and right feed of the operator are alternatively the lifting foot in the stair climbing exercise; and

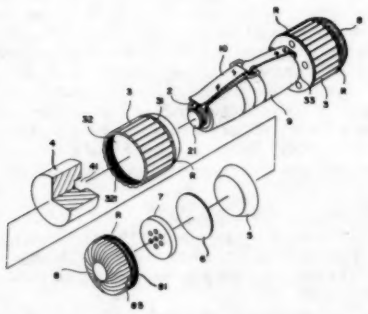
an interconnection mechanism connecting said left and right foot mechanisms comprising an interconnection means and an indirect interconnection means whereby the foot mechanisms are caused to operate in a dependent stepping mode in the lower range of the stroke and in an independent stepping mode in the upper range of the stroke.

5,180,352

APPLIANCE USED IN EXERCISING THE ARMS AND THE LEGS

Change Sreter, No. 451, Ta Tien Road, Homei Chen, Changhua, Taiwan

Filed Dec. 10, 1991, Ser. No. 804,405
Int. Cl.[5] A63B *21/075*
U.S. Cl. 482—108 **2 Claims**



1. An appliance used in exercising the arms and the legs, the appliance comprising:

a grip made from a solid metal rod for exercising the arms, said grip having two unitary screw rods at two opposite ends;

a protective sleeve covered over said grip for comfortable and positive grip;

an adjustable strap fastened to said protective sleeve for securing said grip to the leg or the hand;

two sockets respectively made from a plastic material through the process of injection molding and releasably attached to said grip at two opposite ends, said sockets each having an annular groove around the peripheral surface thereof for fastening a rubber ring, a holding space defined therein, a round hole at one end through the central axis thereof for inserting either screw rod of said grip, and an inner thread at an opposite end;

two counter weights respectively received in said two sockets and releasably attached to said grip at two opposite ends, said counter weights each having a bolt hole at one end for fastening either screw rod of said grip;

two caps respectively covered on said two sockets, said caps each having an outer thread at one end, an annular groove around the peripheral surface adjacent to the outer thread thereof for fastening a rubber ring, a receiving space at the inside, an inner annular groove around the inner wall surface thereof, and a tapered opening at one end opposed to the outer thread thereof;

two electronic oscillators respectively received in said receiving space of either cap, said electronic oscillators being triggered to produce sounds by shock waves;

two division plates respectively fastened in the inner annular groove on either cap to firmly retain said electronic oscillators in place; and

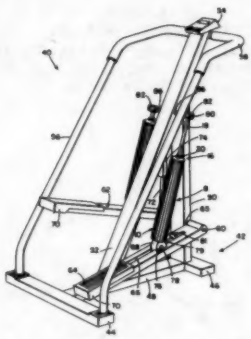
two tapered weights respectively releasably inserted into said tapered opening of either cap and stopped against either counter weight.

5,180,353

HYDRAULIC RESISTIVE APPARATUS FOR EXERCISE EQUIPMENT

Fredric Snyderman, Sharon, Mass., assignor to CSA, Inc., South Easton, Mass.

Filed Feb. 7, 1991, Ser. No. 651,807
Int. Cl.[5] A63B *21/008*
U.S. Cl. 482—111 **15 Claims**



1. An exercise apparatus for performing a variety of exercises, said apparatus comprising:

(a) a hydraulic resistive device, said hydraulic resistive device providing a hydraulic resistive force for the exercise apparatus, said device including a cylinder and a piston, said piston constrained for reciprocal movement in said cylinder, a working fluid contained in said cylinder, said working fluid within said cylinder providing a resistive force when said cylinder and said piston are moved relative to one another during operation of the exercise apparatus, heat being generated when said hydraulic resistive device is operated; and

(b) a heat dissipating device securely engaged to an outer surface of said cylinder, said heat dissipating device including an axially extending, substantially cylindrical tubular sleeve, said sleeve having a body section, an inner diameter of said body section sized such that substantially all of an inner surface of said body section is in surface-to-surface contact with the cylinder of the hydraulic resistive device, and a plurality of fins extending radially from an outer surface of said body section;

(c) said heat dissipating device dissipating heat generated by the relative movement of said piston and said cylinder during operation of said hydraulic resistive device of said exercise apparatus to maintain said working fluid within a selected viscosity range.

5,180,354

ROTARY CUFF EXERCISE MACHINE

Gary A. Jones, Falmouth, Ky., assignor to Hammer Corporation, Cincinnati, Ohio

Filed Nov. 26, 1990, Ser. No. 617,606
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—133 **19 Claims**

1. A rotary cuff exercise machine comprising:

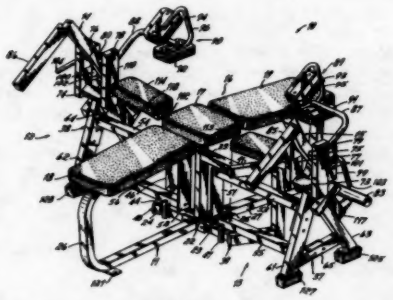
a frame;

a substantially horizontal platform connected to the frame along a vertical midplane;

a lever pivotally connected to the frame along side the platform, one end of the lever adapted to hold at least one removable weight;

an arm extending outwardly from the lever; and

actuating means mounted at a free end of the arm and adapted to be acted upon by one arm of an exerciser to pivot the lever with respect to the frame during performance of an internal rotary cuff rotation while lying face up on the platform with the exerciser's legs pointed in a



first direction and during performance of an external rotary cuff rotation by the other arm of the exerciser while lying face up on the platform with the legs pointed in an opposite direction, said internal and external rotations being performed with an upper portion of the respective exerciser's arm extended in a direction perpendicular from the the torso of the exerciser.

5,180,355

CARTONING APPARATUS

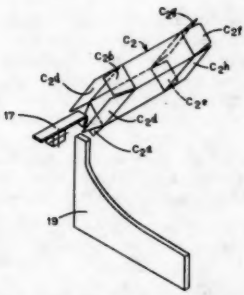
Katsuki Inoue, Ishikawa, Japan, assignor to Shibuya Kogyo Co., Ltd., Ishikawa, Japan

Filed Aug. 21, 1991, Ser. No. 748,021

Claims priority, application Japan, Aug. 22, 1990, 2-220378; Sep. 10, 1990, 2-239273

Int. Cl.[5] B31B *3/80, 5/78*

U.S. Cl. 493—315 **8 Claims**



1. A cartoning apparatus for transferring four sided carton blanks from a carton magazine along a transfer path to an exit location and for simultaneously unfolding carton blanks that have at open ends thereof four flaps which are successively connected to each of the four sides of the carton blank, comprising:

takeoff means for sucking and taking out one by one carton blanks stored in a flat folded state in a carton magazine;

transfer means fixed to a rotary body for receiving and circularly transferring said carton blank which has been taken out by said takeoff means;

carton unfolding means for unfolding said carton blank retained by said transfer means;

first means for turning outward a first flap which is at one opened portion of a cross-sectionally rectangular unfolded carton blank and is on a leading side in the rotational direction of said rotary body, said first means being oriented along said transfer path of the carton blank to effect said outward movement of said first flap as said carton blank is moved by said transfer means toward the exit location; and

second means for bending outward the three other flaps at said opened portion of said carton blank, said second means being oriented along said transfer path of the carton blank to effect said outward movement of the three other flaps as said carton blank is moved by said transfer means toward the exit location;

whereby the four flaps are outwardly turned during a transfer of the carton blank from said carton magazine to the exit location.

5,180,356

CARTON BLANK ERECTER AND FEEDER

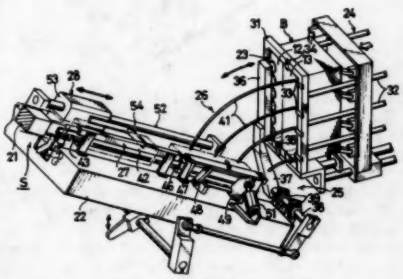
Shigeru Wakabayashi; Shoji Hirose; Shoji Nishioka, and Yasuji Fujikawa, all of Tokushima, Japan, assignors to Shikoku Kakoki Co., Ltd., Tokushima, Japan

Filed Dec. 23, 1991, Ser. No. 811,430

Claims priority, application Japan, Dec. 25, 1990, 2-401575[U]

Int. Cl.[5] B31B *3/80, 5/78*

U.S. Cl. 493—316 **8 Claims**



1. A blank feeder for feeding blanks to a bottom forming mandrel, each of the blanks being folded in a flat form and being unfoldable to a tubular form of square cross section by unfolding the blank to the tubular form and fitting the unfolded blank around the mandrel, the feeder comprising:

a magazine having a delivery opening at one end and accommodating flat blanks arranged closely side by side from said one end toward the other end thereof,

transport means having a path of transport extending from said delivery opening as a starting end to a terminal end along a circular arc having a central axis parallel to the widthwise direction of the blank in the delivery opening, said transport means comprising a suction member, a transport arm having said suction member attached to a forward end thereof, and a rotatable shaft rotatably supporting a base end of said transport arm, said rotatable shaft having an axis which is aligned with a central axis of said circular arc;

said suction member comprising a plurality of suction cups arranged at different distances from said central axis for gripping one side of the blank, so that unfolding of the blank by movement of said suction member along said circular arc causes a greater separation of a gripped side of the blank at the furthest end of the blank from said central axis than at the nearest end of the blank from said central axis;

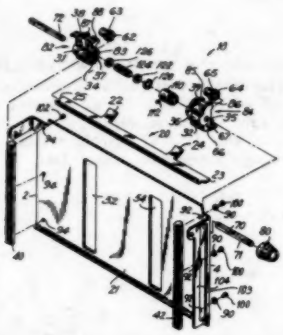
unfolding means for unfolding each blank from the flat form to the tubular form while the blank is being transported by the transport means, said unfolding means having first and second blank unfolding claws disposed at edge portions of

said delivery opening so as to individually engage with opposite ends of the blank in the delivery opening; and means for feeding the opened carton to a mandrel.

5,180,357
BUCKLE CHUTE PAPER STOP ADJUSTMENT MECHANISM

Joseph H. Marzullo, Brookfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 17, 1991, Ser. No. 809,187
Int. Cl.[5] B65H *45/14*
U.S. Cl. 493—420 **8 Claims**



1. In a folding machine buckle chute comprising: a first side wall having lateral edges, a second sidewall having lateral edges and being spaced from and substantially parallel to the first sidewall and forming a paper channel between and a paper stop having at least one member projecting substantially perpendicularly from a position along one of said sidewalls across said channel toward the other of said sidewalls, a paper stop adjustment mechanism comprising:

translation means coupled to said paper stop for fixing said carrier means to said one of said sidewalls and for translating said paper stop along said one of said sidewalls parallel to said lateral edges, and

actuation means linked to said translation means for actuating said translation means from one of said lateral edges to translate said paper stop along said sidewall to position said stop where desired, wherein said translation means includes a first rack and pinion means having a first rack and a first gear for translating said paper stop; and

a first housing in which said first gear is disposed for engaging said first rack, said first housing having a portion defining a first slot for holding one end of said paper stop.

5,180,358
ADJUSTMENT MECHANISM FOR LOW SPEED PARTICLE CONCENTRATOR

Dan R. Pace, Halifax, Canada, assignor to Occam Marine Technologies, Ltd., Halifax, Canada

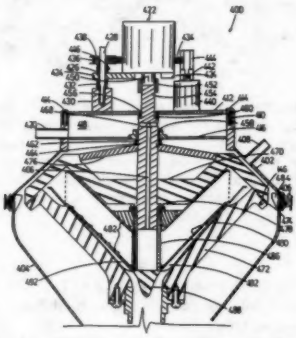
PCT No. PCT/CA91/00019, § 371 Date Sep. 17, 1991, § 102(e) Date Sep. 17, 1991, PCT Pub. No. WO91/11263, PCT Pub. Date Aug. 8, 1991
PCT Filed Jan. 24, 1991, Ser. No. 762,029
Claims priority, application Canada, Jan. 24, 1990, 2008493
Int. Cl.[5] B04B *1/10, 1/14*
U.S. Cl. 494—48 **16 Claims**

1. In a centrifugal particle concentrator having: a housing mountable on a container; upper and lower rotatable bowl members within the housing, the upper bowl member being vertically movable relative to the lower bowl member; rotatable separator means within the bowl members; and a transfer tube extending axially of said concentrator, mounting said upper bowl member and said separator means at one end thereof and being drivingly connected to a drive motor at the other end, said transfer tube having a bore extending longitudinally thereof and communicating said separator means with a discharge chamber of said housing; the improvement in means for adjustably establishing a maximum available gap between said bowl members during operation of said concentrator, comprising:

an annular sun gear extending circumferentially about said drive motor;

a plurality of planetary gears engaging said sun gear and spaced circumferentially thereabout, each planetary gear being threadedly engaged with a non-rotatable mounting screw extending parallel to said transfer tube and being anchored in a boss affixed to said housing;

mounting means secured to said drive motor and extending radially outwardly therefrom, said mounting means being



slidably receivable on each mounting screw between the respective planetary gear and boss, there being a first compression spring on each screw between the mounting means and planetary gear and a second compression spring on each screw between the mounting means and boss; and

an adjustment motor on said housing, drivingly connected to an adjustment gear engaging said sun gear;

whereby rotation of said adjustment gear will cause rotation of said sun gear and consequent rotation of said planetary gears, such rotation of said planetary gears causing movement of each planetary gear along its mounting screw to further compress or to relax said compression springs and thereby control the amount of vertical movement available to said drive motor, transfer tube, separator means and upper bowl member relative to said lower bowl member.

5,180,359
CAST PADDING

Richard G. Dedo, 175 Denise Dr., Hillsborough, Calif. 94010

Continuation of Ser. No. 890,555, Jul. 30, 1986, abandoned. This application Oct. 3, 1988, Ser. No. 252,742
Int. Cl.[5] A61F *5/04*
U.S. Cl. 602—6 **15 Claims**

1. A method of forming a cast on a patient's foot, comprising the steps of:

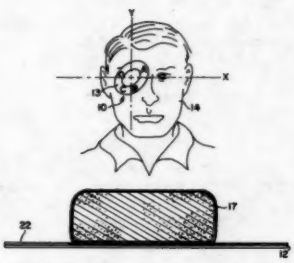
placing an open mesh fabric material on the patient's foot;

placing an elongated strip of porous material compatible with the cast material, said strip having a base portion and a raised edge portion around the patient's foot in the region of the metatarsophalangeal joint proximal the toes;

wrapping a sheet of wadding around the patient's foot to the raised edge portion; and

wrapping a cast material around the patient's foot to the raised edge portion.

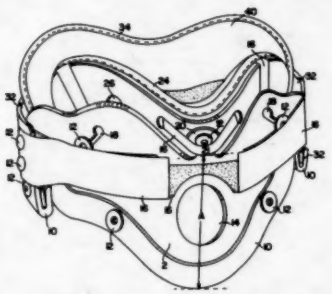
5,180,360
ATRAUMATIC EYE PATCH
Robert W. Rhame, Jr., P.O. Box 1029, Holly Hill, S.C. 29059
Filed Apr. 15, 1991, Ser. No. 685,837
Int. Cl.[5] A61F *13/12*
U.S. Cl. 602—74 **11 Claims**



1. A self-adhering eye patch, said eye patch comprising:
an adhesive backing member for securing the patch to the face of a user; and
inner means for atraumatically maintaining the lid of the eye closed, said inner means including a foam member secured to said backing member and being configured to conform substantially to the shape of an eye socket, and a cover member surrounding said foam member so as to cover the entire portion of said foam member that contacts skin, said inner means for maintaining the lid of an eye closed being of sufficient thickness to maintain the lid securely closed without damaging the eye.

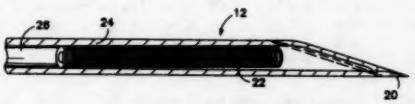
5,180,361
ANTIDECUBITUS IMMOBILIZATION CERVICAL COLLAR
George E. Moore, Jeffersontown, Ky., and Lisa A. G. Tweardy, Mt. Laurel, N.J., assignors to The Jerome Group Inc., Mt. Laurel, N.J.
Filed Nov. 28, 1990, Ser. No. 619,040
Int. Cl.[5] A61H *1/02*
U.S. Cl. 602—18 **10 Claims**

1. A cervical collar comprising:
front and back semi-rigid portions, each having a fixed height;
said front portion comprising a semi-rigid preformed jaw support contoured to follow the jaw line of a patient, and a preformed sternum brace contoured to contact the sternum and upper trapezius of the patient and support said jaw support;
said preformed sternum brace including multiposition openings for attachment and adjustment of said jaw support;
means for adjusting the angulation of said jaw support independent of the height of said preformed sternum brace;
said back portion contoured to follow the curve of and to support the back of the neck and occiput;
said sternum brace having right, left, and central sections;
wherein the height of said right and left sections is independent of the height of said central section, and wherein:



(a) the height of the central section is so selected that the jaw of said patient contacts and is supported by said jaw support and said sternum brace rests upon the sternum of said patient; and
(b) the height of said right and left sections is so selected that the jaw of said patient contacts and is supported by said jaw support and said right and left sections rest upon the upper trapezius of said patient;
where the head of said patient is in a preferred, predetermined alignment.

5,180,362
GONIO SETON
J. G. F. Worst, Julianalaan 11, 9751 BM, Haren, Netherlands
Filed Apr. 3, 1990, Ser. No. 503,690
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—8 **11 Claims**



4. Apparatus for treating glaucoma comprising:
a. a needle having a lumen for piercing the anterior chamber angle wall of an eye; and
b. a helical gonio seton having spaces between adjacent helices for the passage of fluid, said seton being removably located with in said needle.

5,180,363

OPERATION DEVICE

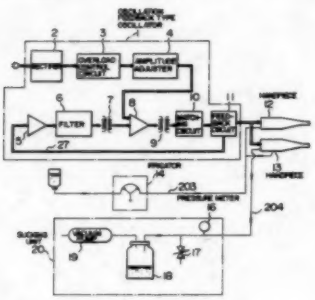
Morito Idemoto; Naohiko Inoue, and Yasuo Noguchi, all of Yokohama, Japan, assignors to Sumitomo Bakelite Company Company Limited, Tokyo, Japan

Continuation of Ser. No. 422,270, Oct. 16, 1989, abandoned. This application Dec. 23, 1991, Ser. No. 813,053

Claims priority, application Japan, Apr. 27, 1989, 1-106044

Int. Cl.[5] A61B *17/32;* **H01L** *41/08*

U.S. Cl. 202—32 **16 Claims**



1. A surgical operation device comprising:

an ultrasonic piezoelectric transducer means for generating ultrasonic vibrations;

an oscillation feedback type oscillator means for supplying high-frequency power to the piezoelectric transducer means;

an ultrasonic vibration transmitter means connected to the piezoelectric transducer means for transmitting and amplifying the ultrasonic vibrations generated by the piezoelectric transducer means;

a sucking unit; and

an irrigator;

wherein the piezoelectric transducer means includes a bolted Langevin type transducer;

wherein the oscillation feedback type oscillator means comprises a feedback circuit which includes a PLL and an oscillation voltage detector engaged to an input of said PLL for generating a feedback oscillation signal for input into the oscillation voltage detector, said PLL including a phase comparator, a low pass filter, a differential amplifier, and a voltage controlled oscillator connected in series to produce the feedback oscillation signal, and

wherein said oscillation voltage detector includes a motional bridge, a base clipper, a voltage adjuster and an input level converter connected in series for input into said PLL, wherein said motional bridge has a branch including said Langevin type transducer driven by the feedback oscillation signal and a second branch including capacitors.

5,180,364

VALVED SELF-PERFUSING CATHETER GUIDE

Robert Ginsburg, 2489 Alpine Rd., Menlo Park, Calif. 94025

Filed Jul. 3, 1991, Ser. No. 725,694

Int. Cl.[5] A61M *31/00, 5/00*

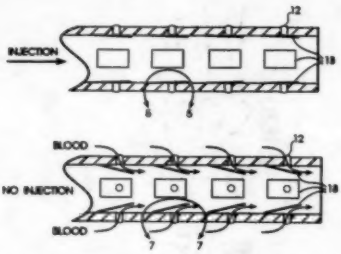
U.S. Cl. 604—53 **22 Claims**

1. A perfusion guiding catheter comprising:

an elongate, flexible catheter body having a proximal end, a distal end, and at least one lumen extending from the proximal end to the distal end and terminating in an open distal port;

a plurality of radial passageways disposed along at least one region of the catheter body; and

means operatively coupled to each passageway permitting unidirectional fluid flow from an exterior region into the



lumen and outward through the open port in response to external pressure higher than lumen pressure.

5,180,365

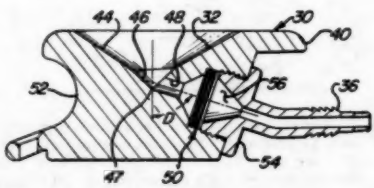
IMPLANTABLE INFUSION DEVICE

William D. Ensminger, 2770 Parkridge Dr.; James A. Knol, 1059 Hasper, and James C. Andrews, 3568 River Pines, all of Ann Arbor, Mich. 48103

Continuation-in-part of Ser. No. 487,541, Mar. 1, 1990, Pat. No. 5,057,084, and a continuation-in-part of Ser. No. 539,793, Jun. 18, 1990, Pat. No. 5,053,013. This application Feb. 15, 1991, Ser. No. 654,661

Int. Cl.[5] A61H *11/00*

U.S. Cl. 604—93 **39 Claims**



1. An implantable infusion port for allowing the introduction of a flexible filament such as a catheter wire or optical fiber into a patient and being accessed using a needle which penetrates the patient's skin with said filament being introduced into the port by said needle, comprising:

housing means defining an enlarged generally funnel shaped entrance orifice, with the surface of said entrance orifice formed of a hard material to guide said needle contacting said orifice to a focus area,

mounting means for fastening said port subcutaneously, an entrance passageway formed by said housing means extending from said focus area to a valve chamber and to an exit passageway communicating with a site within the patient,

valve means within said valve chamber for permitting said filament to pass through said valve means while restricting the flow of fluids across said valve means when said filament is removed, and

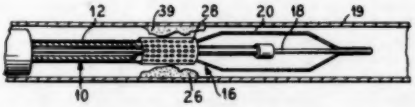
stop means within said entrance passageway between said focus area and said valve chamber for restricting the passage of said needle while permitting said flexible filament to pass through said entrance passageway and engage said valve means.

5,180,366

APPARATUS AND METHOD FOR ANGIOPLASTY AND FOR PREVENTING RE-STENOSIS

W. T. Woods, R.R. 1-Box 13, Chatham, Ill. 62629

Filed Oct. 10, 1990, Ser. No. 597,483
Int. Cl.[5] A61M *25/10*
U.S. Cl. 604—96 24 Claims



1. An apparatus for performing angioplasty comprising:

a multilumen catheter having an inflatable balloon and a separate means for implanting an anti-proliferation agent that is in the form of a pellet in a lining of a vessel wall, the means for implanting being located in juxtaposition to the balloon, the means for implanting including a rigid collar including a plurality of apertures for receiving the pellet and including means for expelling the pellet from the collar without increasing the exterior circumferences of the collar.

5,180,367

PROCEDURE AND BALLOON CATHETER SYSTEM FOR RELIEVING ARTERIAL OR VEINAL RESTRICTIONS WITHOUT EXCHANGING BALLOON CATHETERS

Stavros B. Kontos, Woodcliff Lake, and Jeffrey C. Urbanski, Sparta, both of N.J., assignors to Datascope Corporation, Paramus, N.J.

Continuation of Ser. No. 403,498, Sep. 6, 1989, abandoned. This application Sep. 16, 1991, Ser. No. 759,612
Int. Cl.[5] A61M *25/10*
U.S. Cl. 604—101 17 Claims

1. A system for performing a medical procedure comprising:

a) a first, relatively small diameter, balloon catheter having a catheter portion, a balloon portion, a proximal end and a distal end, with said balloon portion being located at or near said distal end, in said passageway;

b) removable fitting means at or near the proximal end of said first balloon catheter for attachment thereto of fluid pressure application means;

c) a second, larger diameter balloon catheter having a catheter portion, a balloon portion, a proximal end, a distal end, with said balloon portion being located at or near said distal end,

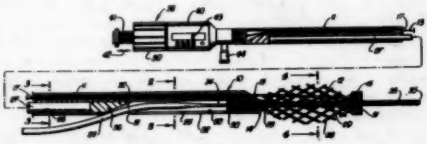
d) sliding guide means at or near the distal end of said second balloon catheter, said sliding guide means having a distal end and a proximal end with a passageway therethrough from the distal to the proximal end thereof, which passageway is of such size as to accommodate therein and permit sliding passage therethrough of the balloon portion and the catheter portion of said first balloon catheter, said sliding guide means being not longer than about ½ the overall length of said second balloon catheter and is comprised of a ring at the distal end of said second balloon catheter.

5,180,368

RAPIDLY EXCHANGEABLE AND EXPANDABLE CAGE CATHETER FOR REPAIRING DAMAGED BLOOD VESSELS

Michi E. Garrison, Santa Cruz, Calif., assignor to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 682,190, Apr. 8, 1991, which is a continuation of Ser. No. 404,815, Sep. 8, 1989, Pat. No. 5,034,001. This application Oct. 11, 1991, Ser. No. 775,143
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—104 19 Claims



1. An intravascular catheter for maintaining the patency of an arterial passageway for an extended period, comprising:

a) an elongated catheter body having a first lumen which extends longitudinally therein over essentially the entire length thereof and a second, much shorter, inner lumen which extends longitudinally in a flexible distal portion of the catheter body between a proximal guidewire port and a distal guidewire port in the distal portion of the catheter body and which is adapted to receive a guidewire therein;

b) an expandable cage formed of a plurality of strands which has a distal end with an opening therein and a proximal end which is secured to the distal end of the catheter body;

c) a flexible tubular guide element extending through the expandable cage which has an inner lumen in communication with the second inner lumen within the catheter body and adapted to receive a guidewire therein; and

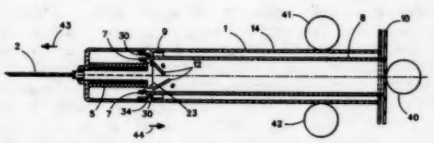
d) a control wire disposed within the first lumen having a distal end secured to the distal end of the expandable cage and having means on the proximal end at the catheter body proximal end to longitudinally move the control wire so as to adjust the axial distance between the proximal and distal ends of the expandable cage and thereby adjust the radial dimension of the expandable cage.

5,180,369

SELF DESTRUCTIVE SAFETY SYRINGE

Edward D. Dysarz, 11423 Triola La., Houston, Tex. 77072

Filed Jan. 20, 1992, Ser. No. 827,366
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 15 Claims



1. A syringe assembly held by fingers and thumb for injecting medicament or fluid into a body or part of a body comprising:

a needle cannula with a first end and a second end, wherein there is a point at said first end and wherein there is a cannula formed in said needle cannula that extends from said first end through said second end;

a slideable piston with a first end and a second end, wherein said second end of said needle cannula is fixed to said first end of said slideable piston and wherein said slideable

piston further has a cannula formed in said slideable piston whereby said cannula extends from said first end of said slideable piston through said second end of said slideable piston and is further connected with said cannula of said needle cannula;

a slideable piston flange with a first side and a second side, wherein said first side of said slideable piston flange is fixed to said second end of said slideable piston, and wherein a cannula is formed in said slideable piston flange that connects with said cannula in said slideable piston and wherein said cannula in said slideable piston flange extends from said first side through said second side of said slideable piston flange;

a guide tube with a first end and a second end and an inside surface and an outside surface, wherein said slideable piston is laterally held by said inside surface of said guide tube and said slideable piston is laterally supported by said inside surface of said guide tube and wherein said second end of said guide tube is near said slideable piston flange;

a first barrel flange with an inside and an outside side, whereas said inside of said first barrel flange is fixed to said first end of said guide tube and said outside of said first barrel flange is nearer to said needle cannula;

a first barrel with a first end and a second end, wherein said first end of said first barrel is fixed to said inside of said first barrel flange;

an elongated hollow barrel with a first end and a second end and an inside surface and an outside surface, wherein said elongated hollow barrel is suitably fixed to said second end of said first barrel at said first end of said elongated hollow barrel and wherein said elongated hollow barrel further has a longitudinal axis in the center of said elongated hollow barrel;

an elongated hollow barrel flange with a first side and a second side and further is fixed essentially near the first end and said inside surface of the said elongated hollow barrel and further extends inward toward the said longitudinal axis of the said elongated hollow barrel;

a slideable piston shatter plate with a first side and a second side, wherein said slideable piston shatter plate extends from said second side of said slideable piston flange to said first side of said elongated hollow barrel flange, and wherein said second side of said slideable piston flange is pressed against said first side of said slideable piston shatter plate and said second side of said slideable piston shatter plate is further pressed against said first side of said elongated hollow barrel flange further forming a fluid tight and a gas tight connection;

a spring, wherein said spring is compressed between said inside of said first barrel flange and said first side of said slideable piston flange and wherein said spring is disposed on said outside of said guide tube and wherein said spring is further thrusting on said slideable piston flange and wherein said slideable piston flange is thrusting on said slideable piston shatter plate and wherein said slideable piston shatter plate is thrusting on said elongated hollow barrel flange;

an elongated hollow plunger inside of said elongated hollow barrel, said elongated hollow plunger having a first end and a second end and further having an inside and an outside and further having a sliding gasket formed around the said outside of the said first end of said elongated hollow plunger, wherein said sliding gasket further forms a liquid and gas tight seal between said inside surface of said elongated hollow barrel and said outside of said elongated hollow plunger and wherein said elongated hollow plunger further has a thumb flat formed at said second end of said elongated hollow plunger;

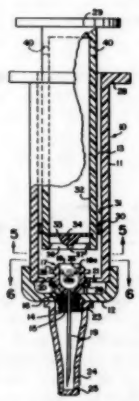
a plunger shatter plate with a first side and a second side, wherein said plunger shatter plate is suitably fixed to said first end of said elongated hollow plunger at the said second side of said plunger shatter plate wherein a liquid and gas tight seal is formed between said elongated hollow plunger and said plunger shatter plate and wherein said elongated hollow plunger is pushed in a needle cannula direction by a said finger or thumb forcing said medicament or fluid through said cannula of said slideable piston and through said needle cannula and into said body or part of said body wherein said elongated hollow plunger is further pushed in a needle cannula direction thrusting said plunger shatter plate into said slideable piston flange further causing said plunger shatter plate to shatter and wherein said first end of said elongated hollow plunger is further thrust into said slideable piston shatter plate further causing said slideable piston shatter plate to shatter or fail wherein said slideable piston shatter plate can no longer restrain said slideable piston and said slideable piston flange and said compressed spring and wherein said compressed spring further thrusts said slideable piston flange fixed to said slideable piston and said needle cannula in the thumb flat direction into said elongated hollow plunger wherein said needle cannula is completely enclosed within said inner surface of said elongated hollow plunger and said thumb flat and is further prevented from exiting said elongated hollow plunger by the length of the expanded spring that is now greater than the combined length of said needle cannula and said slideable piston wherein said needle cannula cannot accidentally prick or injure anyone.

5,180,370

SAFETY HYPODERMIC SYRINGE WITH RETRACTABLE NEEDLE

Elgene R. Gillespie, 353 Freedom Ave. NE., Canton, Ohio 44704

Filed May 18, 1992, Ser. No. 884,389
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 **29 Claims**



1. A safety hypodermic syringe comprising:

(A) a hollow barrel for containing a fluid, having a rear end opening and a front end opening;

(B) a hollow needle extending through the front end opening of the barrel to permit fluid from the barrel to be injected through the needle;

(C) mounting means temporarily securing the needle within the front end of the barrel with the needle protruding forwardly from the front end opening of the barrel until an injection given by the needle has been completed;

(D) a hollow plunger containing an axial chamber therein which is large enough to receive the needle and mounting means therein, the plunger having a front end inserted through the rear end opening of the barrel and being slideable longitudinally within said barrel to move inwardly when pressure is applied to an outwardly extend-

ing rear end of the plunger, the front end of the plunger being open for communication between the axial chamber and the interior of the barrel except when the end is initially covered by an end cover which temporarily seals the chamber of the plunger until the plunger is depressed a sufficient distance to complete the injection of fluid from the chamber through the needle;

(E) means removing the end cover from the front end of the plunger;

(F) means moving the needle rearwardly out of the front end opening of the barrel with at least part of the mounting means and into a stored position within the hollow plunger; and

(G) means to retain the needle and mounting means in the stored position to prevent the needle from protruding from the front end of the barrel.

5,180,371

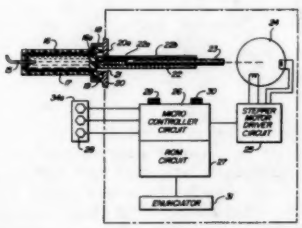
HYPODERMIC ANESTHETIC INJECTION APPARATUS AND METHOD

Ronald P. Spinello, Westbury, N.Y., assignor to Spintech, Inc., York, Pa.

Continuation of Ser. No. 191,138, May 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 868,745, May 30, 1986, Pat. No. 4,747,824. This application Feb. 8, 1991, Ser. No. 652,495

Int. Cl.[5] A61M *31/00*

U.S. Cl. 604—118 **7 Claims**



1. Apparatus for the injection of anesthetics including a hollow hypodermic needle, a handle assembly for carrying the needle, and a single source of liquid anesthetic, the apparatus comprising:

pump means having a positive duty cycle to expel liquid anesthetic from the needle tip,

programmed discharge flow rate control means associated with the positive duty cycle to selectively expel liquid anesthetic at a first rate not to exceed 0.25 to 1.0 cc. per minute and at a second rate of greater than approximately 2.0 cc. per minute,

and control means to select between the first and second flow rates, whereby the first flow rate can be established during implantation of the needle in the tissue to establish a small positive low flow rate during penetration, and the second flow rate can be established after implantation.

5,180,372

SPLITTABLE CATHETER AND METHOD

Brett R. Vegoe, Mound, and Richard L. Molacek, Maple Grove, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 23, 1991, Ser. No. 763,788

Int. Cl.[5] A61M *5/18*

U.S. Cl. 604—161 **6 Claims**

1. In a method of making a placement catheter by providing polymeric tubing with a longitudinal line of weakness extending from a proximal end to a distal end of the catheter, the improvement comprising: applying cross-linking radiation to the weakened tubing.

5,180,373

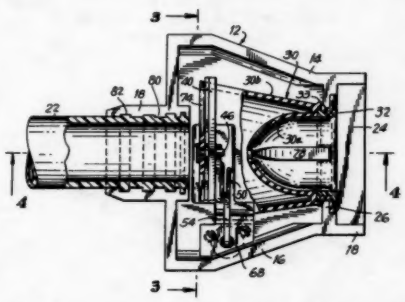
VALVE SYSTEM FOR INTRODUCING OBJECTS INTO ANATOMICAL BODY PORTIONS

David T. Green, Westport; Henry Bolanos, East Norwalk, and Henry Sienkiewicz, Stamford, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Jun. 7, 1991, Ser. No. 711,756

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—167 **32 Claims**



1. A valve assembly adapted for introduction of an elongated object into a patient's body which comprises:

(a) first valve means formed of a resilient material and defining an aperture for reception of the object, said aperture being configured and dimensioned such that insertion of the object into said aperture will cause the resilient material defining said aperture to resiliently engage the outer surface of the object in a substantially fluid tight manner;

(b) second valve means positioned adjacent said first valve means in general alignment therewith, said second valve means defining an aperture in general alignment with said aperture of said first valve means, and being formed of a flexible material at least in the region defining said aperture; and

(c) manually operable means to selectively permit said aperture of said second valve means to be opened or closed so as to permit entry of the object.

5,180,374

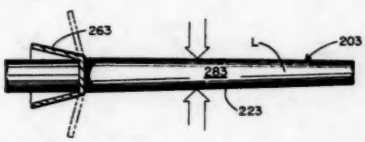
SAFETY NEEDLE CONTAINMENT

Paul Porteous, 735 Terrace View Pl., Port Hueneme, Calif. 93041

Filed Jan. 7, 1992, Ser. No. 817,538

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—192 **12 Claims**



1. Safety needle containment for a needle structure comprising a hub and a projecting needle, said containment comprising a needle sheath normally covering the needle before and after use, said sheath comprising a tubular element sized to enclose said needle and having a wall adapted to be grasped by fingers at a locus midway along its length for withdrawal and insertion of said needle, and a disc element mounted transversely on said sheath tubular element above said locus, said disc element being resistant to needle penetration and projecting laterally of said sheath tubular element a distance to clock said syringe needle from reaching said fingers gripping said sheath tubular

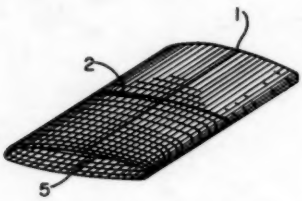
element below said disc, said disc element defining an over-center structure adapted to snap between said parallel and transverse positions relative to said sheath tubular element responsive to flexing of the sheath tubular element wall below said disc element.

5,180,375

WOVEN SURGICAL DRAIN AND WOVEN SURGICAL SPONGE

Miriam H. Feibus, 2557 Morrocroft La., Charlotte, N.C. 28226

Filed May 2, 1991, Ser. No. 694,748
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—264 **15 Claims**



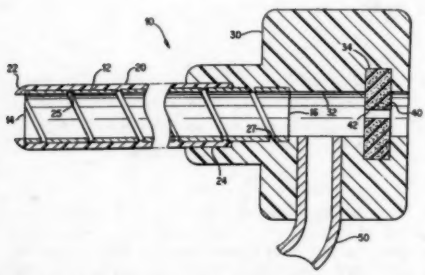
1. A woven surgical sponge which comprises: a first plurality of yarns and a second plurality of yarns, the yarns of said first plurality of yarns being substantially parallel to each other and extending in a first direction, the yarns of said second plurality of yarns being substantially parallel to each other and extending in a second direction substantially perpendicular to said first direction and woven with said first plurality of yarns to form an elongate woven fabric defining a tube-like channel and wherein said first plurality of yarns and said second plurality of yarns include conductive and nonconductive yarns and said conductive yarns make electrical contact with one another so as to form an electrically conductive matrix and an absorptive filler material inserted in said tube-like channel.

5,180,376

NON-BUCKLING THIN-WALLED SHEATH FOR THE PERCUTANEOUS INSERTION OF INTRALUMINAL CATHETERS

Robert E. Fischell, Dayton, Md., assignor to Cathco, Inc., Dayton, Md.

Filed May 1, 1990, Ser. No. 517,213
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—282 **8 Claims**



1. A sheath for introduction of catheters into a vessel of a living body comprising:

an inner core in the form of a flat wire helical metal coil having an exposed inner surface forming an inner lumen of the sheath, the flat wire helical metal coil consisting of a multiplicity of turns with adjacent turns being separated from each other so as to be non-contacting, the flat wire of said flat wire helical metal coil having a thickness between 1 and 5 mils and a width that is 5 to 50 times the metal thickness,

a plastic covering surrounding the outer surface of said metal coil said plastic covering having an extension into the space between said adjacent turns of the metal coil, the inside diameter of said plastic extension being less than the outside diameter of the metal coil and being greater than or equal to the inside diameter of the metal coil; and,

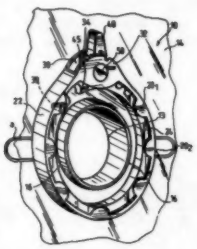
a plastic adapter operably joined to the proximal end of said helical coil and said plastic covering.

5,180,377

OSTOMY APPLIANCE

Henri Holtermann, Saint Jean de Luz, France, assignor to Laboratoires Biotrol, Paris, France

Filed Oct. 31, 1990, Ser. No. 606,610
Claims priority, application France, Nov. 13, 1989, 89 14834
Int. Cl.[5] A61F *5/44*
U.S. Cl. 604—342 **20 Claims**



1. An ostomy appliance, comprising:

a pouch-holder with an end-piece for being fixed about a stoma opening in the body of a user so that said end-piece surrounds the stoma in its condition of use,

a waste material collecting pouch adapted to be releasably secured with the pouch-holder by a nose of the pouch and which is provided for engaging said end-piece,

a control mechanism for the appliance connected to the pouch-holder, and

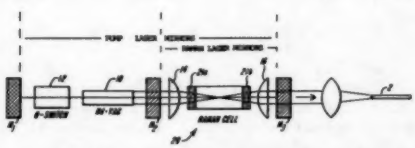
a deformable clamping member connected with the pouch-holder and which is separate from said control mechanism for cooperating directly and solely with the pouch nose, said clamping member including means for providing a sealed mechanical connection of said pouch nose with said end-piece in response to actuation of said control mechanism.

5,180,378

LASER SURGERY SYSTEM

Robert T. V. Kung, Andover, and Robert B. Stewart, Haverhill, both of Mass., assignors to Abiomed, Inc., Danivers, Mass.

Continuation of Ser. No. 342,481, Apr. 24, 1989, abandoned.
This application Nov. 14, 1990, Ser. No. 613,110
Int. Cl.[5] A61N *5/02*
U.S. Cl. 606—10 **8 Claims**



1. A medical laser source for the generation of laser light

suitable for fiber optic delivery at a power level effective for performing surgery, such medical laser source comprising

a solid state pump laser providing a pulsed multimode beam at a first wavelength λ_o and having a TEM_{oo} mode as a minor component

a gas filled Raman cell driven by said multimode beam arranged in an optical feedback path with said pump laser for producing a Stokes beam at a shifted wavelength λ_1 in said Raman cell

cross flow means for providing a flow of gas across a central region of said Raman cell

optical means for focusing the pulsed multimode beam into said central region

output coupling means for coupling light from said Raman cell to an optical fiber

said optical means focusing the multimode beam into said central region with an intensity effective to produce said Stokes beam with a TEM_{oo} mode as a primary component, and said cross flow means being operable to provide a flow across said central region to overcome thermal lensing when said pump laser is pulsed at a repetition rate in excess of approximately 100 Hz, whereby said laser source efficiently wavelength shifts and cleans up the multimode beam of the pump laser to produce a substantially single mode beam for fiber optic delivery while achieving an effective power level for surgery.

5,180,379

ELECTRODE WITH PRE-WIRED LEADS

Gerald E. Drake, Oakdale, Minn.; Thomas R. Gray, Colon, Nebr., and Paul G. Izen, Inver Grove Heights, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 4, 1991, Ser. No. 680,583
Int. Cl.[5] A61B *17/39*; H01R *13/62*
U.S. Cl. 606—32 **14 Claims**

1. A connector for a medical dispersive electrode assembly wherein the electrode assembly serves as the interface between medical equipment and the skin of a patient and includes an electrode having a conductor and at least one wire, the connector comprising:

a first portion;

a second portion;

means for securing the first portion of the connector to the second portion of the connector with the wire and conductor therebetween; and

means for holding the wire in electrical contact with the conductor between the first and second portions of the connector, wherein the holding means is separate from the securing means and includes a textured wire contacting surface mounted on the first portion of the connector.

9. A medical dispersive electrode assembly wherein the electrode assembly serves as the interface between medical equipment and the skin of a patient and includes an electrode having a conductor and at least one wire, the assembly comprising:

an electrode having a conductor;

at least one wire;

a connector having first and second portions;

means for securing the first portion of the connector to the second portion of the connector with the wire and conductor therebetween; and

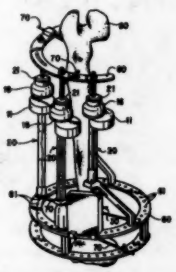
means for holding the wire in electrical contact with the conductor between the first and second portions of the connector, wherein the holding means is separate from the securing means and includes a textured wire contacting surface mounted on the first portion of the connector.

5,180,380

AUTOMATIC COMPRESSION-DISTRACTION-TORSION METHOD AND APPARATUS

John A. Pursley; Jordan M. Holloway, both of Indian, and Thomas L. Wakefield, Anchorage, all of Ak., assignors to Autogenesis Corporation, Anchorage, Ak.

Continuation of Ser. No. 320,586, Mar. 8, 1989, Pat. No. 4,973,331. This application Jul. 6, 1990, Ser. No. 548,814
The portion of the term of this patent subsequent to Nov. 27, 2007, has been disclaimed.
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—54 **32 Claims**



1. A medical apparatus, comprising:

a plurality of support members;

a plurality of rods interconnecting said support members and including adjustment means for enabling the rod length to be adjusted;

means connected to said support members for securing said support members to a patient; and

an automatic drive means for controlling said adjustment means of said plurality of rods, said drive means comprising at least one motor for incrementally adjusting the adjustment means of said plurality of rods to adjust the length of said rods, and a controller means for providing pulses to said at least one motor to control the incremental adjustments of plurality of rods and for storing information regarding the number of stepwise adjustments of said rod length of said plurality of rods by said at least one motor.

5,180,381

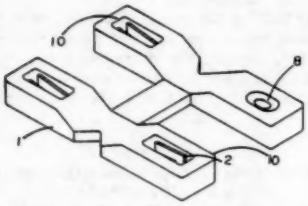
ANTERIOR LUMBAR/CERVICAL BICORTICAL COMPRESSION PLATE

Gilbert M. Aust, and Timothy E. Taylor, both of 100 Washington St. Ste. 204, Huntsville, Ala. 35801

Filed Sep. 24, 1991, Ser. No. 765,014
Int. Cl.[5] A61B *17/56, 17/58*; A61F *2/44*
U.S. Cl. 606—61 **2 Claims**

1. A spinal fixation device, comprising a substantially flat plate having opposite ends, said ends being bifurcated to form a pair of spaced generally parallel legs on said ends, said pairs of legs extending away from each other in opposite directions, each of said legs having therein an opening for receiving a screw, said legs being provided with screw seats adjacent to

said openings, said screw seats being so positioned that when a screw is inserted into one of said openings and the head of the

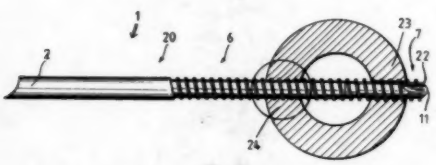


screw is seated on the screw seat the screw extends from the plane of said plate at an angle of about 45°.

5,180,382
BONE SCREW

Robert Frigg, Davos-Platz; Stephan Perren, Davos-Dorf; Martin Allgöwer, Reinach, and Paul Gisin, Waldenburg, all of Switzerland, assignors to Synthes (U.S.A.), Paoli, Pa.

Filed Dec. 17, 1991, Ser. No. 808,594
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—65 **21 Claims**

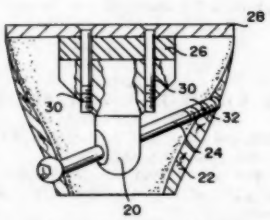


1. A bone screw having a screw head at one end, a tip at the other end and a shaft between the head and tip, said shaft having a first threaded segment at the head end with a major diameter D1 and a minor diameter d_1 and a second threaded segment at the tip end with a major diameter D2 and a minor diameter d_2, d_2 being less than d_1, the thread in said segments having the same pitch, and the ratio $(d_1-d_2)/d_2$ being between about 0.004 and about 0.020.

5,180,383
METHOD AND DEVICE FOR ATTACHING ARTIFICIAL JOINT IMPLANTS TO THE ENDS OF BONES

Frank A. Haydon, P.O. Box 1295, Franklin, N.C. 28734

Filed Oct. 9, 1991, Ser. No. 773,210
Int. Cl.[5] A61F *2/02*
U.S. Cl. 606—72 **1 Claim**

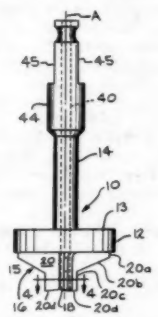


1. An apparatus for retaining a joint implant comprising:
an anchor implantable within a bone, said anchor defining a longitudinal axis and having a lower proximal end and upper distal end, the upper distal end being widened relative to the lower proximal end and defining at least two, spaced, threaded apertures, the lower proximal end defining a single aperture, with said single aperture being angled with respect to said longitudinal axis;
two threaded countersunk bolts connectably engaging two of said apertures in said anchor and extending above the edge of said bone for retaining the implant on the bone edge;
a dead man bolt having a head portion and a threaded portion, said dead man bolt extending through said single angled aperture so that said head and threaded portion of the dead man bolt engage outer cortical portions of the bone and retain the anchor within the bone.

5,180,384
METHOD FOR IMPLANTING A PATELLAR PROSTHESIS

W. E. Michael Mikhail, 4203 Shamley Green, Toledo, Ohio 43623

Filed Feb. 8, 1991, Ser. No. 652,882
Int. Cl.[5] H61F *5/04*
U.S. Cl. 606—80 **12 Claims**



1. A method of planting a patellar prosthesis in a human patella having an articular surface with an apex comprising:
(a) providing a patellar prosthesis having a body portion including an upper dome and a lower stem on the opposite side of said body portion from said dome;
(b) drilling a passageway in said patella inwardly from the side having said articular surface;
(c) providing elongated guide means in said passageway;
(d) providing a reamer having a head with upper and lower sides, cutting means depending from said lower side and a central cannulation extending through said cutting means and said head, said cannulation having a size to fit over said guide wire, said head having a plurality of apertures extending therethrough from said lower to said upper side;
(e) positioning said reamer over said elongated guide means and reaming a cavity in said patella having a size and configuration to receive said patellar prosthesis while using said guide means as a guide to determine the position of said cavity and expelling debris formed during said reaming through the apertures in said head; and
(f) placing said patellar prosthesis in said cavity in bonded relationship with said patella.

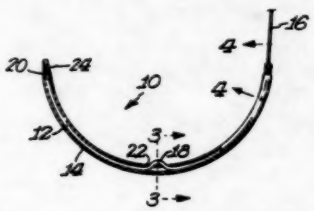
5,180,385
SUTURING ASSEMBLY AND METHOD

Sidney Sontag, 7300 SW. 18th St., Plantation, Fla. 33317

Filed May 21, 1992, Ser. No. 887,181
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—224 **6 Claims**

1. A suturing assembly comprising:
a) a casing comprising
i) an elongated hollow shaft having a generally longitudinal axis,

ii) an aperture along a portion of the longitudinal axis, and
iii) an opening terminating the casing at the distal end;
b) a surgical needle comprising
i) a stem along a generally elongated longitudinal axis having a hump along a portion thereof laterally offset from the longitudinal axis, and
ii) a sharpened distal point terminating the stem in one direction;
c) said surgical needle located within said casing whereby
(i) the longitudinal axis of said surgical needle and casing are disposed in a substantially coaxial relationship,
ii) with the hump of said surgical needle disposed within and protruding through the aperture of said casing,



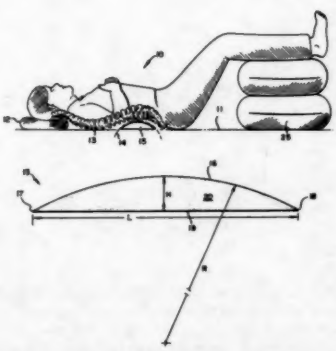
iii) the sharpened distal point of the said surgical needle being disposed proximal to the opening of the distal end of said casing at rest and capable of being projected through the said distal opening of said casing upon the application of force to the said hump of said surgical needle, and
iv) whereby the said surgical needle and said casing can be manipulated as a unit upon the application of manipulative force thereto; and
d) a suture having an end portion thereof inserted into and fixed to the needle, casing or both.

5,180,386

METHOD AND DEVICE FOR MAINTAINING OR RESTORING NORMAL LUMBAR CURVATURE

Gerald R. Kennedy, Jr., Alma Center, Wis., assignor to Gravi-Tech, Inc., Alma Center, Wis.

Filed May 3, 1991, Ser. No. 695,691
Int. Cl.[5] A61F *5/02*
U.S. Cl. 606—240 **12 Claims**



1. A device for maintaining or restoring normal curvature of a person's lumbar spine comprising:
a structure consisting essentially of a base lying in a base plane for cooperating with a flat support surface, an upper surface having a curvature in a first direction which corresponds essentially to the normal curvature of a person's spine and extending in said first direction a sufficient distance to support the person's first through fifth lumbar vertebrae, and still allowing the ilia and substantially the entire sacrum to rest on the flat support surface, and extending across in a second direction perpendicular to the first direction essentially straight and continuous and far enough to support the person's back muscles on each side of the vertebrae sufficiently to allow the first through fifth lumbar vertebrae to conform to said curvature in the first direction,
said upper surface curvature being circular so as to form a section of a cylinder, the upper surface being non-deformable from end to end so as to essentially maintain its shape as the person's weight is placed upon its, the circular curvature having a radius of curvature between 14 and 20 centimeters and the height of the device from the base plane to the highest point being between 2 to 2.5 centimeters,
whereby, when a person lies on the device with the device placed in the small of the person's back, the person's weight, being resisted vertically by the non-deformability of the device, is distributed along the curved upper surface of the device to promote passive traction of the lumbar spine.

5,180,387

ANGLED HOLE VENTRICULAR CATHETER WITH NON-CIRCULAR BORE

Jamshid B. G. Ghajar; Robert J. Hariri, and Fathali G. Ghadjar, all of New York, N.Y., assignors to Neurodynamics, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 98,097, Sep. 17, 1987, Pat. No. 4,784,638. This application Nov. 2, 1988, Ser. No. 266,451
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—266 **17 Claims**

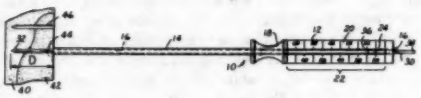
1. A catheter for placement into a host comprising
a flexible elongated body having a wall thickness sufficient to contain and transport fluid therein and having a forward end and tip for insertion into the host;
a plurality of spaced apertures located in said forward end of said body spaced from said tip and positioned so as to minimize abrasion of tissue upon insertion of said catheter into said host; and
said body having an internal bore having a non-circular cross section to increase the structural integrity and effective flow area of the catheter compared to those having a circular cross sectional bore;
wherein each of said apertures extends through the wall thickness at an angle such that a portion of said wall thickness is visible when viewing said aperture perpendicular to the axis of said body.

5,180,388

BONE PINNING SYSTEM

Paul DiCarlo, East Falmouth, Mass., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 28, 1990, Ser. No. 545,398
Int. Cl.[5] A61F *2/28*
U.S. Cl. 623—16 **11 Claims**



1. A method of repairing fractured bones utilizing an applicator device, drill means, plunger means and at least one bone pin means, said applicator device having a handle member defining a lateral recess and at least one tube means, said drill means having first mark means thereon and said handle member having second mark means thereon wherein at least one of the mark means is a scale, said method comprising the steps of:

drilling a hole in said fractured bones utilizing said applicator device to guide said drill means;

determining the depth of said hole by aligning said first mark means and said second mark means while said drill means is extending through said applicator device;

selecting said bone pin means in accordance with the determined depth of said hole prior to insertion of said bone pin means in said hole and prior to placement of said bone pin means into said applicator device; and

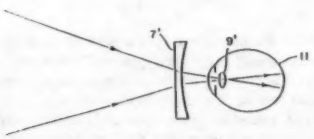
inserting said pin means in said hole utilizing said applicator device and said plunger means by inserting said pin means into said lateral recess and then pushing against said pin means with said plunger means.

5,180,389

INTRAOCULAR-EXTERNAL LENS COMBINATION SYSTEM AND METHOD OF USING SAME

Anthony Donn, 635 W. 165th St., New York, N.Y. 10032, and Charles J. Koester, 60 Kent Rd., Glen Rock, N.J. 07452

Continuation of Ser. No. 687,190, Apr. 18, 1991, abandoned, Continuation of Ser. No. 432,852, Nov. 7, 1989, Pat. No. 5,074,875, Continuation of Ser. No. 289,459, Dec. 22, 1988, abandoned, Continuation of Ser. No. 218,820, Jul. 12, 1988, abandoned, Continuation of Ser. No. 109,165, Oct. 16, 1987, abandoned, Continuation of Ser. No. 316,920, Oct. 30, 1981, Pat. No. 4,710,197. This application Nov. 25, 1991, Ser. No. 798,842
The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.
Int. Cl.[5] A61F *2/16*
U.S. Cl. 623—6 **9 Claims**



1. A method for providing demagnification of an image on the retina of an eye of a patient while providing an increased field of vision, said method comprising:

a) evaluating visual requirements of the patient to determine a combination of an intraocular lens comprising a positive section with an external negative lens to provide substantial demagnification while providing an increased field of vision;

b) implanting the intraocular lens comprising a positive section within said eye; and

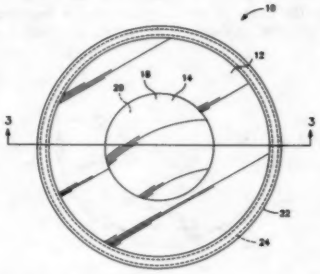
c) providing the external negative lens.

5,180,390

INTRAOCULAR LENS WITH REINFORCING ELEMENT

Robert C. Drews, 211 N. Meramec Ave., Clayton, Mo. 63105

Filed Jul. 30, 1991, Ser. No. 738,093
Int. Cl.[5] A61F *2/16*
U.S. Cl. 623—6 **3 Claims**



1. An intraocular lens comprising:

a. an optic;

b. a substantially circular continuous flexible skirt surrounding said optic and secured to said optic so as to form a predetermined geometrical shape, said skirt terminating in an arcuate edge having a cross section thicker than the cross section of said skirt; and,

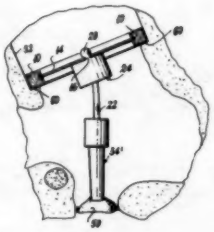
c. a reinforcing element embedded within said arcuate edge about its entire perimeter for reinforcing said skirt with respect to said optic and providing flexibility for folding through a small incision of an eye and having memory to return said skirt to the original predetermined geometrical shape after being folded.

5,180,391

MIDDLE EAR PROSTHESIS

Franco Beoni, Via Venturini 6, 29100 Piacenza, Italy

Filed Aug. 16, 1990, Ser. No. 568,217
Claims priority, application Italy, Jun. 7, 1990, 20570 A/90
Int. Cl.[5] A61F *2/18*
U.S. Cl. 623—10 **20 Claims**



1. A middle ear prosthesis, comprising:

a circular ring having an inner surface and an outer surface, said inner surface defining the ring opening, said circular ring being made of a substance which comprises a substantially rigid synthetic material compatible with the human body and of a type able to bond to the osseous tissue with which it is placed in contact;

an elastic membrane of synthetic material compatible with the human body and fixed to said ring to close said opening, said elastic membrane having an outer edge;

a columellar element of material compatible with the human body and comprising an elongated intermediate portion of

substantially rigid but bendable material, said elongated intermediate portion having first and second ends;

a first connection means for releasably connecting said first end of the intermediate portion of the columellar element to a central region of the elastic membrane; and

a second connection means for fixing said second end of said intermediate portion to the stapes of the ear, said second connection means consisting of a piece of substantially rigid synthetic material having means capable of bonding to the osseous tissue with which it comes into contact, wherein said circular ring is placed in the opening of the external acoustic meatus after the opening in the acoustic meatus has been bored to a diameter to fit to the outer surface of said circular ring.

5,180,392

ANASTOMOTIC DEVICE

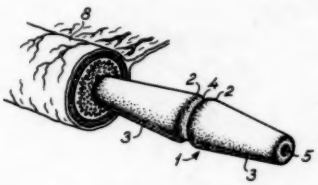
Einar Skeie, Dyrehavegardsvej 45, DK-2800 Lyngby, and Daniel Bar-Shalom, Rypevaenget 213, DK-2980 Kokkedal, both of Denmark

Continuation of Ser. No. 305,529, Feb. 1, 1989, abandoned. This application Nov. 15, 1990, Ser. No. 614,690

Claims priority, application Denmark, Feb. 1, 1988, 505/88

Int. Cl.[5] A61F *2/04*

U.S. Cl. 623—11 **22 Claims**



1. A prosthesis for use in joining hollow organ parts or systems, said prosthesis comprising a fragmentable body defining outer organ-supporting surface parts thereon adapted to be arranged in abutting relationship with inner surface parts of the organs to be joined;

said body having a compressive strength sufficiently low to allow fragmentation of the body by application of a pressure to the outer surface of the tubular organs subsequently to the anastomosing of the same, said pressure being below a pressure causing any substantial lesion of the tissue of the tubular organ parts and said compressive strength being in the range of from 20 to 100N.

5,180,393

ARTIFICIAL LIGAMENT FOR THE SPINE

Jacques Commarmond, Saint Remy, France, assignor to Polyclinique de Bourgogne & Les Hortensiad, France

Filed Mar. 17, 1992, Ser. No. 852,556

Int. Cl.[5] A61F *2/08*

U.S. Cl. 623—13 **5 Claims**

1. Artificial ligament (i) for the spine, intended to be fixed by pedicle screws on two vertebrae (**31, 33**) of the spinal column (**30**), characterized in that it consists of:

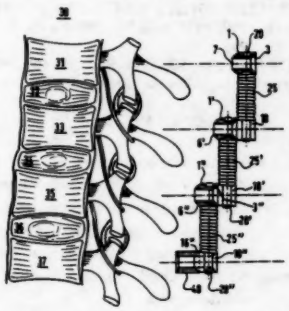
a first hollow eyelet (**1, 1', 1''**) and a second hollow eyelet (**10, 10', 10''**), of general diabolo shape, each one comprising in order:

a concave seat (**3**) intended to receive the head of the fixation screw;

a body (**4**) having a narrowed area (**5**); a convex hump (**6**) complementing the concave seat (**3**) and intended to be directed towards the vertebra (**31–37**);

an artificial ligament proper, made of a flexible textile material, consisting of:

a longitudinal primary winding (**20**) arranged in figure of eight formation between the narrowed areas (**5, 15**) of two successive eyelets (**1, 10**);



a transverse secondary winding (**25**) arranged in contiguous spirals around the primary winding (**20**).

5,180,394

ZIRCONIUM OXIDE AND NITRIDE COATED PROSTHESIS FOR WEAR AND CORROSION RESISTANCE

James A. Davidson, 2573 Windy Oaks Dr., Germantown, Tenn. 38138

Continuation of Ser. No. 489,373, Mar. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 385,285, Jul. 25, 1989, Pat. No. 5,037,438. This application Nov. 18, 1991, Ser. No. 794,826

The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.

Int. Cl.[5] A61F *2/30*

U.S. Cl. 623—18 **21 Claims**

1. A prosthesis for implantation in a patient, comprising:

(a) a prosthesis body formed of zirconium or zirconium alloy comprising an implant portion for inserting into the body tissue of the patient;

(b) a bearing surface comprising at least one condyle on the prosthesis body;

(c) a tibial component formed of an organic polymer or polymer-based composite and adapted to cooperate with the bearing surface; and

(d) a thin in situ formed coating of zirconium nitride directly on at least a portion of the bearing surface of the condyle portion for reducing wear of the organic polymer or polymer-based composite tibial component.

5,180,395

SELF-LOCKING BONE-SHAFT PART

Kaj Klaue, Neuenegg, Switzerland, assignor to Laboratorium für experimentelle Chirurgie, Davos, Switzerland

PCT No. PCT/CH89/00122, § 371 Date Feb. 21, 1990, § 102(e) Date Feb. 21, 1990, PCT Pub. No. WO90/00374, PCT Pub. Date Jan. 25, 1990

PCT Filed Jun. 23, 1989, Ser. No. 459,791

Claims priority, application Switzerland, Jul. 5, 1988, 02559/88

Int. Cl.[5] A61F *2/34*

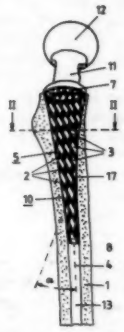
U.S. Cl. 623—23 **5 Claims**

1. A shaft for an adaptable bone prosthesis comprising

first and second sets of relatively movable fibers crossing each other and braided together to form a hollow, frusto-conical body having an adaptable length and an adaptable diameter, said body having a central axis, an outer surface, a proximal end and a distal end, said proximal end being larger than said distal end,

said first and second sets of fibers each subtending an angle with said central axis of said body and wherein said angle is substantially the same for both sets of fibers;

said body being dimensioned for insertion into a bone to form a joint-end prosthesis or bone shaft replacement and



being adaptable to conform to the shape of the environment in which it is used.

5,180,396

PROCESS FOR DYEING KERATINOUS FIBRES WITH OXIDATION DYES COMBINED WITH INDOLE DERIVATIVES AND DYEING COMPOSITION EMPLOYED

Jean F. Grollier, Paris; Jean Cotteret, Verneuil sur Seine, and Didier Garoche, Levallois Perret, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 284,739, Dec. 15, 1988, abandoned. This application Nov. 20, 1991, Ser. No. 795,344

Claims priority, application Luxembourg, Dec. 18, 1987, 87086

The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.

Int. Cl.[5] A61K *7/13*

U.S. Cl. 8—405 34 Claims

1. A process for dyeing keratinous fibers comprising applying to said fibers at least one composition (A) containing in a medium suitable for dyeing said fibers, at least one indole derivative present in an amount ranging from 0.03 to 3 weight percent based on the total weight of said composition (A) and at least one oxidation dye which generates a colored compound by oxidation in air within one hour and a coupler, said oxidation dye being present in an amount ranging from 0.25 to 5 weight percent based on the total weight of said composition (A), in combination with (a) a source of iodide ions present in an amount ranging from 0.08 to 1.5 weight percent, expressed as I^- ions and based on the total weight of said composition (A) or (b) hydrogen peroxide, said composition (A) having a pH ranging from 2 to 7, and the application of said composition (A) is preceded or followed by the application of composition (B) comprising in a medium suitable for dyeing said fibers

(a') hydrogen peroxide at a pH ranging from 2 to 12 when said composition (A) contains a source of iodide ions, or

(b') a source of iodide ions at a pH ranging from 3 to 11 when said composition (A) contains hydrogen peroxide.

5,180,397

PROCESS FOR DYEING KERATINOUS FIBRES WITH COUPLERS AND/OR "RAPID" OXIDATION DYES COMBINED WITH AN IODIDE AND DYEING COMPOSITION EMPLOYED

Jean F. Grollier, Paris; Jean Cotteret, Verneuil-sur-Seine, and Didier Garoche, Levallois-Perret, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 198,806, May 25, 1988, Pat. No. 4,985,955. This application Oct. 17, 1990, Ser. No. 599,113

Claims priority, application Luxembourg, May 25, 1987, 86899

Int. Cl.[5] A61K *7/13*

U.S. Cl. 8—405 29 Claims

1. A process for dyeing keratinous fibers comprising applying to said fibers at least one composition (A) comprising, in a medium suitable for dyeing said fibers, an oxidation dye, comprising (1) a mixture of (a) at least one coupler selected from the group consisting of a phenol, a metadiphenol, a meta-aminophenol, a meta-phenylenediamine, a monohydroxylated derivative of naphthalene, a polyhydroxylated derivative of naphthalene, a monohydroxylated derivative of aminonaphthalene, a polyhydroxylated derivative of aminonaphthalene, a pyrazolone and a benzomorpholine, and (b) at least one "rapid" oxidation dye capable of generating colored compounds by simple oxidation in air during an exposure time on said fibers of less than one hour and being selected from the group consisting of a trihydroxylated derivative of benzene, a diaminohydroxybenzene, an aminodihydroxybenzene, an aminohydroxybenzene, a triaminobenzene, a substituted 1,2-dihydroxybenzene, brazilin, haematoxyline and alkanet extract, or (2) at least one said "rapid" oxidation dye, said oxidation being present in an amount ranging from 0.01 to 10 percent by weight based on the total weight of said composition (A), in combination with iodide ions present in an amount ranging from 0.007 to 4 percent by weight, expressed as I^- ions, relative to the total weight of said composition (A), and applying to said fibers composition (B) comprising, in a medium suitable for dyeing said fibers, hydrogen peroxide having a pH ranging from 2 to 12, the application of said composition (A) to said fibers preceding or following the application of said composition (B) to said fibers.

5,180,398

CELLULOSE OXIDATION BY A PERFLUORINATED HYDROCARBON SOLUTION OF NITROGEN DIOXIDE

Franklin Boardman, Englishtown, and Lowell Saferstein, Edison, both of N.J., assignors to Johnson & Johnson Medical, Inc., Arlington, Tex.

Filed Dec. 20, 1990, Ser. No. 630,631

Int. Cl.[5] D06M *13/322*

U.S. Cl. 8—181 10 Claims

1. A process for oxidizing cellulose comprising the step of reacting the cellulose with an effective amount of a solution of nitrogen dioxide in a perfluorocarbon solvent.

5,180,399

PROCESS FOR DYEING KERATINOUS FIBRES WITH OXIDATION BASES COMBINED WITH AN IODIDE AND DYEING COMPOSITION EMPLOYED

Jean F. Grollier, Paris; Jean Cotteret, Verneuil-sur-Seine, and Didier Garoche, Levallois-Perret, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 566,097, Aug. 13, 1990, abandoned, which is a continuation of Ser. No. 198,807, May 25, 1988, abandoned. This application Jun. 18, 1991, Ser. No. 717,253

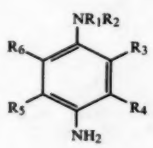
Claims priority, application France, May 25, 1987, 86 899

Int. Cl.[5] A61K *7/13*

U.S. Cl. 8—405 33 Claims

1. A process for dyeing keratinous fibers comprising applying to said fibers at least one composition (A) comprising, in a medium suitable for dyeing said fibers, at least one oxidation base selected from the group consisting of

(i) a paraphenylenediamine of the formula



(I)

wherein

R_1 and R_2, each independently, represent hydrogen, C_1–C_6 lower alkyl, C_1–C_6 alkyl substituted with at least one hydroxy or with a substituent selected from the group consisting of methoxy, methylsulphonamino radical, aminocarbonyl radical, furfuryl radical, phenyl radical and phenyl radical substituted with an amino,

R_3 and R_6, each independently, represent hydrogen, C_1–C_6 lower alkoxy, halogen, C_1–C_6 lower alkyl and C_1–C_6 lower alkyl substituted with at least one hydroxy, and

R_4 and R_5, each independently, represent hydrogen, C_1–C_6 lower alkoxy, C_1–C_6 lower alkyl or halogen,

with the proviso that R_1 and R_2 are not simultaneously hydrogen when R_3, R_4, R_5 and R_6 all represent hydrogen,

and the salts thereof with an inorganic or organic acid;

(ii) an N,N'-diphenylalkylene diamine wherein the phenyl moiety is substituted at the para position with hydroxy or amino group unsubstituted or substituted with a C_1–C_6 alkyl group, and in which the amino group joined by the alkylene is unsubstituted or substituted by a member selected from the group consisting of C_1–C_6 alkyl, C_1–C_6 hydroxyalkyl and C_1–C_6 aminoalkyl;

(iii) a para-aminophenol;
(iv) an ortho-aminophenol;
(v) an ortho-phenylenediamine; and
(vi) a heterocyclic oxidation base selected from the group consisting of 2,3-diamino-6-methoxypyridine, 2-(2-hydroxyethyl)amino-5-aminopyridine, 3,6-diaminopyridine, 2,6-dimethoxy-3-aminopyridine and 2-methylamino-3-amino-6-methoxypyridine,

said oxidation base being present in an amount ranging from 0.01 to 10 percent by weight based on the total weight of said composition (A), in combination with iodide ions present in an amount ranging from 0.007 to 4 percent by weight, expressed as I^- ions, relative to the total weight of said composition (A), and applying to said fibers composition (B) comprising in a medium suitable for dyeing said fibers, hydrogen peroxide having a pH ranging from 2 to 12, the application of said composition (A) to said fibers, preceding or following the application of said composition (B) to said fibers.

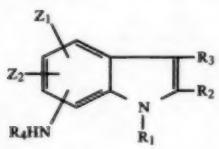
5,180,400

METHOD FOR DYEING KERATINOUS FIBRES USING AN AMINOINDOLE IN COMBINATION WITH A QUINONE DERIVATIVE

Alain Baudry, Gonesse; Alex Junino, Livry-Gargan, and Hervé Richard, Paris, all of France, assignors to L'Oreal, Paris, France

Filed May 29, 1991, Ser. No. 707,056
Claims priority, application France, May 29, 1990, 90 06660
Int. Cl.[5] A61K *7/13*
U.S. Cl. 8—405 **17 Claims**

1. A process for dyeing keratinous fibers comprising applying to said fibers at least one composition A comprising in a medium suitable for dyeing said fibers at least one aminoindole having the formula



(I)

wherein

R_1 represents hydrogen or a linear or branched C_1–C_4 alkyl,

R_2 and R_3 represent hydrogen, C_1–C_4 alkyl, carboxyl or (C_1–C_4) alkoxycarbonyl,

R_4 represents hydrogen, C_1–C_4 alkyl, C_1–C_4 hydroxyalkyl, C_2–C_4 polyhydroxyalkyl, acetyl or C_1–C_6 aminoalkyl wherein the amine moiety optionally in monosubstituted or disubstituted by a C_1–C_4 alkyl,

Z_1 and Z_2, each independently, represent hydrogen, C_1–C_4 alkyl, halogen or C_1–C_4 alkoxy,

NHR_4 occupying the 4, 5, 6, or 7 positions; and

a salt of said aminoindole, the application of said composition A to said fibers being preceded or followed by the application to said fibers of composition B comprising, in a medium suitable for dyeing said fibers at least one quinone derivative selected from the group consisting of an orthoquinone, a para-benzoquinone, an orthobenzoquinone monoimine, an orthobenzoquinone diimine, a para-benzoquinone monoimine, a para-benzoquinone diimine, a 1,2-napththoquinone, a 1,4- naphthoquinone, an ortho benzoquinone sulphonimide, a para-benzoquinone sulphonamide, an α,ω-alkylene-bis-1,4-benzoquinone, a 1,2-naphthoquinone monoimine, a 1,2-napthoquinone diimine, a 1,4-naphthoquinone monomine and a 1,4-napthoquinone diimine,

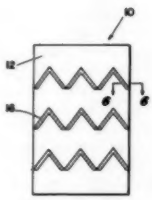
the said amino indole and said quinone derivative being chosen such that the difference in the redox potential E_i of said amino indole, determined at pH 7 in a phosphate medium on a vitreous carbon electrode by voltametry, and the redox potential E_q of said quinone derivative, determined at pH 7 in a phosphate medium by polarography on a mercury electrode relative to a saturated calomel electrode is such that $\Delta E = E_i - E_q \leqq 470$ mV.

5,180,401

PRINTED WOVEN BLANKET

Daniel B. Owenby, Swannanoa, and Gene Quesinberry, Black Mountain, both of N.C., assignors to Beacon Manufacturing Company, Swannanoa, N.C.

Filed Sep. 30, 1991, Ser. No. 768,167
Int. Cl.[5] B32B *9/00*
U.S. Cl. 8—478 **7 Claims**



1. A woven blanket comprising:

a fabric constructed of woven yarn; said fabric having a first side and a second side; said fabric having been printed with a dye on at least a portion of said first side; said fabric not printed on said second side; a visible pattern being formed on said first side and said second side; the visible characteristics of said pattern on said second side being substantially the same in intensity and resolution as the pattern on said first side; said second side exhibiting substantially the same color and pattern as said first side.

5,180,402

DYED SYNTHETIC FIBER COMPRISING SILVER-SUBSTITUTED ZEOLITE AND COPPER COMPOUND, AND PROCESS FOR PREPARING SAME

Koichi Kubota; Tetsuya Katoh, both of Aichi; Masayuki Hirata, Kyoto, and Kazuya Hayashi, Otsu, all of Japan, assignors to Toray Industries, Inc., Japan

Filed May 3, 1991, Ser. No. 695,220
Claims priority, application Japan, May 8, 1990, 2-119497
Int. Cl.[5] D06P *5/00;* **D01F** *1/10*
U.S. Cl. 8—490 **16 Claims**

1. A dyed synthetic polyamide fiber having antibacterial and antifungal properties which comprises, based on the weight of the fiber, 0.01 to 20% by weight of a silver-substituted zeolite exhibiting antibacterial and antifungal action and 0.001 to 1.0% by weight of a substantially water-insoluble copper compound, said substantially water-insoluble copper compound being present independent of zeolite particles in the fiber and the fiber being dyed with an acid or a metallized dye and having a maximum water solubility in water of 100 mg per 100 g of water at a temperature of 20° C.

5,180,403

METHOD FOR VACUUM DEAERATION

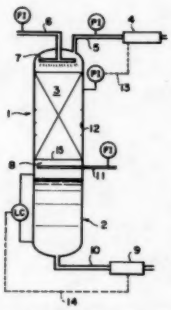
Masahiko Kogure, Miyagi, Japan, assignor to Nomura Micro Science Co., Ltd., Atsugi, Japan

Filed Nov. 26, 1991, Ser. No. 798,157
Claims priority, application Japan, Nov. 26, 1990, 2-321854
Int. Cl.[5] B01D *19/00*
U.S. Cl. 55—53 **6 Claims**

1. A method for vacuum deaeration of a dissolved gas in a raw liquid, in a vacuum degasifier column maintained at a pressure slightly higher than a saturated steam pressure at a temperature of the raw liquid, said column having a region filled with packings, spraying the raw liquid downwardly from

above the region at a volumetric flow rate and meantime carrying out an evacuation inside said column to maintain said pressure, the method comprising the steps of:

carrying out said evacuation inside said vacuum degasifier column from above said region; and



introducing an inert gas upwardly from below said region at a volumetric flow rate in the range of from 0.001 to 1.0, based on the volumetric feed flow rate of said raw liquid taken as 1, simultaneously with said evacuation.

5,180,404

CORONA DISCHARGE ARRANGEMENTS FOR THE REMOVAL OF HARMFUL SUBSTANCES GENERATED BY THE CORONA DISCHARGE

Andrzej Loreth, Akersberga, and Vilmos Török, Lidingö both of Sweden, assignors to Astra-Vent AB, Sweden

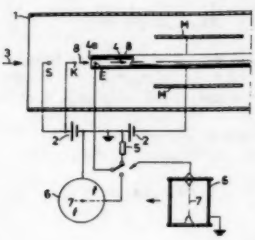
PCT No. PCT/SE89/00690, § 371 Date Jun. 10, 1991, § 102(e) Date Jun. 10, 1991, PCT Pub. No. WO90/06180, PCT Pub. Date Jun. 14, 1990

PCT Filed Nov. 29, 1989, Ser. No. 690,899

Claims priority, application Sweden, Dec. 8, 1988, 8804447

Int. Cl.[5] B03C *3/14*

U.S. Cl. 55—117 **12 Claims**



1. An improvement in arrangements for removing harmful gaseous substances that are generated by corona discharge in corona discharge apparatus which includes at least one corona electrode (K), at least one target electrode (M), and a d.c. voltage source (2) which is connected between said corona electrode and said target electrode and which has a voltage such as to produce on the corona electrode a corona discharge which will result in the generation of air ions which migrate from eh corona electrode to the target electrode, said arrangement including a suction channel (4) which is restricted relative to he space (1) containing the corona electrode (K) and the target electrode (M) and which has located in the immediate vicinity of the corona electrode (K) an inflow opening (*4a*) from said space (1), and said channel (4) is operative to conduct the harmful substances to a device (9) for rendering said substances harmless, or to evacuate said harmful substances from said apparatus, wherein said improvements in arrangements includes at least one additional electrode (E) which is connected to a d.c. potential which, in relation to the potential of the corona electrode (k), has the same plurality as the potential of the target electrode (M) and which is mounted in said suction channel (4), or at a location adjacent to said opening, such that an ion current will flow from the corona electrode (K) to the additional electrode (E) and give to an airflow (8) past the corona electrode (K) and into the suction channel (4) through said channel opening (*4a*).

5,180,405

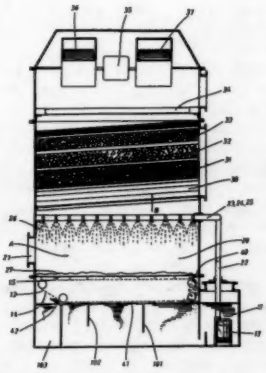
OILY SMOKE PURIFYING APPARATUS OF CENTRAL PROCESSING SYSTEM TYPE

Chen Kuan, Taipei, Taiwan, assignor to Chi Chang Enterprises Co., Ltd., Taipei, Taiwan

Filed Jun. 9, 1992, Ser. No. 895,722

Int. Cl.[5] B01D *47/12, 53/04*

U.S. Cl. 55—227 **4 Claims**



1. An oily smoke purifying apparatus of central processing system type including:

a water tank provided on the inside bottom of the housing which is filled with water of an appropriate level;

a water pump installed in said water tank;

a conveyor equipped with many projecting blade wipers installed along the water surface;

an inclined catch plate fixed above the conveyor;

a conduit extending to the outside and connecting said water pump to several branch pipes which extend into the housing from the outside and spray a water screen in the housing, forming a cooling chamber between the branch pipes and the inclined catch plate so that the smoke intake is located on the side wall of the cooling chamber;

a moisture separation plate, a plastic fiber layer, a coke layer and an active carbon layer provided in the portion of the housing above the branch pipes in an upward sequence;

an ultraviolet light tube mounted over the active carbon layer;

a fan set and a motor installed above the ultraviolet light tube in the upper portion of the housing where is connected to the outlet on the top of the housing and which fan set is driven by the motor;

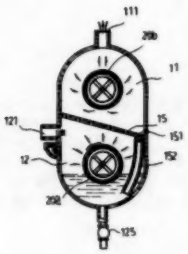
and characterized in that said fan set draws oily smoke to the cooling chamber where steam and oil are separated; greasy mud falling to the water surface beneath and being collected to the waste oil tank in a corner of the housing, steam passing through the upper portion of the housing and being exhausted to the outside.

5,180,406

MUFFLER FOR EXHAUST GASES OF A DIESEL ENGINE

Chin-Tai Shih, No. 76, Ku Shon 2nd Road, Ku Shon Section, Kaohsiung, Taiwan

Filed Aug. 16, 1991, Ser. No. 746,481
Int. Cl.[5] B01D *47/00*
U.S. Cl. 55—232 **21 Claims**



1. An improved gas muffler for exhaust gases of a diesel engine comprising:

a hollow housing;

a partition plate disposed within said housing and dividing the interior of said housing into an upper chamber and a lower chamber;

a predetermined amount of cleaning fluid of a suitable composition provided within said lower chamber;

a first and second generally cylindrical filter members rotatably secured in respective said lower and upper chambers of said housing, each said cylindrical filter having a hollow interior and providing a central shaft, a holder frame secured on said shaft, and a gas permeable filter sleeve attached on said holder frame;

an external rotation means for rotating said first and second filter members through a coupling means;

an inlet in communication with said lower chamber of said housing through which exhaust gases from said diesel engine can enter therein;

an external gas conduit with the opposite ends thereof in communication with the interiors of respective cylindrical said first and second filter members, through respective open ends thereof;

an outlet in communication with said upper chamber of said housing through which cleaned said exhaust gases can exit therefrom;

a flowback means provided on said partition plate through which condensed cleaning fluid in said upper chamber of said housing can drain back into said lower chamber thereof;

wherein, said exhaust gases from said diesel engine enter said lower chamber of said housing through said inlet and into the interior of the rotating said first filter member through said filter sleeve thereon, permeated with cleaning fluid cycled therethrough by the rotation thereof, which extracts carbon precipitates and noxious compounds from said exhaust gases;

said exhaust gases then pass through said external conduit to the interior of the rotating said second filter member and passes through the filter sleeve thereon into said upper chamber of said housing, which further cleans said exhaust gases and extracts vapors of said cleaning fluid, condensing in said filter sleeve thereon and being sloughed off by the rotation thereof;

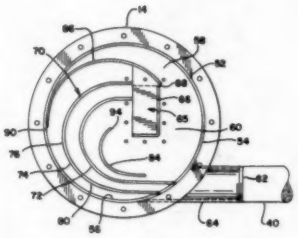
cleaned said exhaust gases exit said upper chamber of said housing through said outlet thereon, and condensed said cleaning fluid in said upper chamber flows back to said lower chamber of said housing through said flowback means on said partition plate.

5,180,407

VACUUM LOADER WITH VANED AND SHORT TANGENTIAL SEPARATOR

Thomas M. DeMarco, 5815 N. Cicero, Chicago, Ill. 60646

Filed Nov. 14, 1991, Ser. No. 792,297
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—302 **23 Claims**



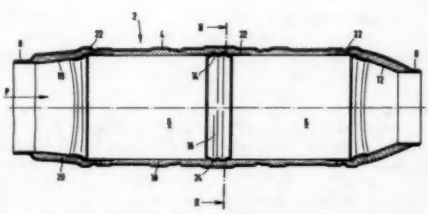
1. A vacuum loader for removing particulate material comprising a compact vaned and short tangential separator means for partially dedusting and separating a substantial amount of particulates from a fluid, said compact vaned and short tangential separator means having vane means for minimizing clogging and substantially enhancing separation of said particulates, said compact vaned and short tangential separator defining inlet means for receiving said fluid containing said particulates and outlet means including an upwardly facing fluid outlet port for discharge of said separated fluid and particulates and a lower particulate outlet, said vane means being arranged tangentially along a generally horizontal flow path with at least one elongated central vane extending continuously from said inlet means to said outlet means, said compact vaned and short tangential separator having a height ranging from about 4 inches to about 12 inches, and said inlet means having a diameter ranging from about 2 inches to about 6 inches.

5,180,408

DEVICE FOR TREATING THE EXHAUST GASES OF INTERNAL COMBUSTIN ENGINES WITH TWO EXHAUST GAS TREATMENT BODIES ARRANGED AT SPACED LOCATIONS

Siegfried Wörner, Esslingen-Berkheim; Georg Wirth, Kirchheim/Teck, and Peter Zacke, Albershausen, all of Fed. Rep. of Germany, assignors to J. Eberspacher, Esslingen, Fed. Rep. of Germany

Filed Dec. 30, 1991, Ser. No. 815,941
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1990, 4042266
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—482 **16 Claims**



1. Device for treating exhaust gases of an internal combustion engine, comprising:

a housing formed of two partial shells welded together along a first partial shell longitudinal flange and a second partial shell longitudinal flange to form a welded edge pair, said

housing having an exhaust intake opening and an exhaust outlet opening defining two open end zones connected to an exhaust gas line, providing a flow passage for the exhaust gas between said end zones;

two exhaust gas treatment bodies through which exhaust gas flows, said exhaust gas treatment bodies being arranged one behind the other in a flow direction and being arranged at spaced locations from one another in said housing;

a protective ring formed of sheet metal, said protective ring delimiting a space between the two exhaust gas treatment bodies at an outer side of said two exhaust gas treatment bodies;

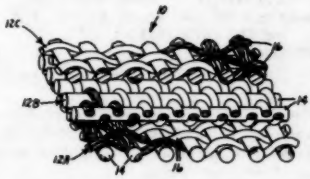
said protective ring including at least one sheet metal flap, which extends between said first partial shell longitudinal flange and said second partial shell longitudinal flange, said sheet metal flap being welded to said housing at said welded edge pair.

5,180,409

HOT-GAS-FILTERING FABRIC OF SPACED UNCRIMPED SUPPORT STRANDS AND CRIMPED LOFTY FILL YARNS

Edward M. Fischer, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 30, 1992, Ser. No. 827,994
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—486 **21 Claims**



1. A fabric useful for filtering particulate matter from a stream of hot gases, which fabric comprises an unknotted weave of

flexible, substantially incompressible, substantially uncrimped, spaced support strands and

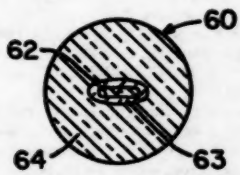
flexible, lofty, substantially fully crimped fill yarns which are pulled tightly against said support strands.

5,180,410

METHOD OF MAKING POLARIZATION RETAINING FIBER

George E. Berkey, Pine City, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Jul. 30, 1990, Ser. No. 560,090
Int. Cl.[5] C03B *37/022*
U.S. Cl. 65—3.11 **16 Claims**



3. A method of making a single-mode optical fiber having at least one polarization retaining property, said method comprising the steps of

depositing a coating of core glass particles on a mandrel having a diameter between 25 and 50 mm,

depositing a coating of cladding glass particles on the surface of said core glass coating, the combined thickness of said coatings of core and cladding glass being at least 6 mm,

removing said mandrel from said coatings of core and cladding particles to form a tubular porous preform,

consolidating said tubular porous preform to form a dense glass preform having a longitudinal aperture therethrough, the ratio of the inside diameter of said dense glass preform to the outside diameter thereof being within the range of 0.3 to 0.9,

stretching said dense glass preform and collapsing said aperture, thereby forming an elongated, flattened rod having an elliptically shaped core region,

applying cladding material to said rod to form a draw blank, and

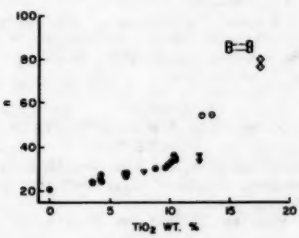
drawing said draw blank to form a polarization retaining single-mode optical fiber having an elliptically-shaped core, said at least one polarization retaining property of said fiber being determined by the aspect ratio of said core.

5,180,411

OPTICAL WAVEGUIDE FIBER WITH TITANIA-SILICA OUTER CLADDING AND METHOD OF MANUFACTURING

Marcella R. Backer; Ralston R. Cavender, Jr.; Peter C. Jones, all of Wilmington, N.C., and James A. Murphy, Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Continuation-in-part of Ser. No. 456,141, Dec. 22, 1989, Pat. No. 5,067,975. This application Oct. 18, 1991, Ser. No. 779,521
Int. Cl.[5] C03B *37/025*
U.S. Cl. 65—3.12 **14 Claims**



1. A method for manufacturing a fatigue resistant optical waveguide fiber with a TiO_2-SiO_2 outer cladding, comprising,

forming a doped SiO_2 preform with a core portion and a cladding portion,

depositing a layer of TiO_2-SiO_2 soot with a TiO_2 concentration profile on the outside of said cladding portion to create an augmented preform, said TiO_2-SiO_2 soot layer including at least one cylindrical axially symmetric layer with thickness of about 0.1 μm or greater having a TiO_2 concentration greater than 10.5 wt. %,

exposing said augmented preform to an atmosphere containing chlorine and oxygen at a temperature within the range of about 900° to 1400° C., said oxygen being present in a concentration that is sufficient to substantially maintain said TiO_2 concentration profile of said TiO_2-SiO_2 layer,

consolidating said preform into a glass blank with a TiO_2-SiO_2 outer cladding layer, and

drawing said glass blank with a TiO_2-SiO_2 outer cladding

layer into an optical waveguide fiber with inhomogeneities in the outer TiO_2-SiO_2 layer of the fiber.

5,180,412

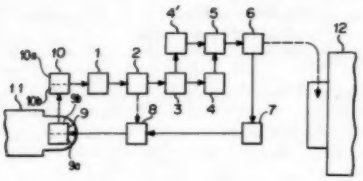
APPARATUS FOR FORMING A GLASS PRODUCT AND A METHOD FOR FORMING A GLASS PRODUCT

Yoshihiro Tsuchimoto, Musashino; Toshikazu Ikezawa, Sakura; Naoki Morihiro, and Naoya Shimizu, both of Funabashi, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jul. 30, 1991, Ser. No. 737,650

Int. Cl.[5] C03B *11/00, 11/14*

U.S. Cl. 65—66 **23 Claims**



20. A method for forming a glass product which comprises at least steps of:

feeding a glass gob to a mold placed on a carrier means of a plurality of carrier means, said feeding occurring as a carrier means is adjacent to and directly under a glass gob feeding device;

press forming the glass gob in a press forming device; and

removing a press-formed body by a formed body removing device;

said method further including the step of transferring the plurality of carriers along a path in which said feeding, press forming and removing devices are disposed along said path, said path including at least one divergence at which the path divides into at least two sub-paths such that only a portion of the plurality of carrier means travels along one of the at least two sub-paths, said path further including a convergence at which the sub-paths meet.

5,180,413

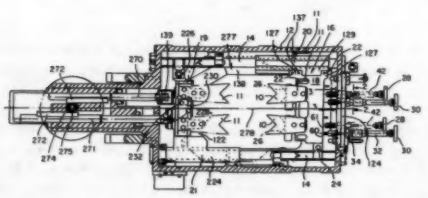
SHEAR MECHANISM FOR GLASSWARE FORMING MACHINE

Steven J. Pinkerton, Avon, and Alan Menard, Bolton, both of Conn., assignors to Emhart Glass Machinery Investments Inc., Wilmington, Del.

Filed Dec. 24, 1991, Ser. No. 814,748

Int. Cl.[5] C03B *7/12*

U.S. Cl. 65—334 **4 Claims**



1. A shear mechanism for shearing discrete gobs from at least one runner of molten glass comprising

a frame, including front and rear walls interconnecting opposed sides,

a pair of guide rails extending between said walls proximate the sides of said frame, a centerline extending parallel to said guide rails and located centrally therebetween,

one shear blade assembly mounted for reciprocating movement along said guide rails, said assembly including an elongated guide rail support operatively associated with one of said guide rails and the center of mass of said one shear blade assembly being located on one side of said centerline of said frame,

a second shear blade assembly mounted for reciprocating movement along said guide rails, said second assembly including an elongated guide rail support operatively associated with the other guide rail and the center of mass of said second shear blade assembly being located on the other side of said centerline of said frame,

horizontally related rack and pinion means including

first rack means connected to said one shear blade assembly and displacable along an axis substantially intersecting the center of mass of said one shear blade assembly, and

second rack means connected to said second shear blade assembly and displacable along an axis substantially intersecting the center of mass of said second shear blade assembly.

5,180,414

HERBICIDAL COMPOSITIONS COMPRISING N-PHOSPHONOMETHYLGLYCINE AND ALKYL POLYOXYETHYLENE PHOSPHORIC ACID ESTER SURFACTANTS

Francois Darchy, Ste Foy Les Lyon, and Jean-Claude Zobel, Lyons, both of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Filed May 21, 1991, Ser. No. 703,722

Claims priority, application France, May 21, 1990, 90 06543

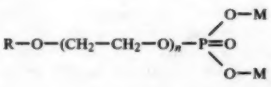
Int. Cl.[5] A01N *25/30, 33/04, 57/20*

U.S. Cl. 504—206 **37 Claims**

1. A liquid herbicidal composition comprising an aqueous solution containing:

(a) a herbicidally effective amount of N-phosphonomethylglycine and/or a herbicidally active derivative thereof, said amount being at least about 40 grams of glyphosate equivalent per liter of solution; and

(b) an effective amount of an activating surfactant of the formula



wherein R is an alkyl radical having from 4 to 12 carbon atoms, n is an integer from 2 to I0 and M is hydrogen, sodium, ammonium or alkylammonium.

5,180,415

PREEMERGENCE WEED CONTROL IN SELECTED CROPS

Ahmad Omid, Walnut Creek, Calif., assignor to Chevron Chemical Company, San Ramon, Calif.

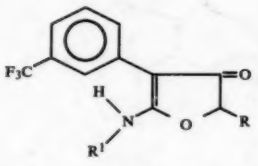
Continuation of Ser. No. 947,006, Dec. 29, 1986, abandoned.

This application Oct. 23, 1989, Ser. No. 426,473

Int. Cl.[5] A01N *43/08*

U.S. Cl. 504—299 **17 Claims**

1. A method for providing preemergence herbicidal weed control in a crop selected from the group consisting of cotton, peanuts, peas, and sorghum which comprises applying to the habitat soil of said crop, within 7 days before the planting of seeds of said crop up to 3 days after planting, an amount which is effective to destroy or suppress weeds and is safe with respect to said crop, of a compound or mixture of compounds selected from the group having the formula:



(I)

wherein R is phenyl; R^1 is methyl or ethyl; and compatible salts thereof.

5,180,416

HERBICIDAL COMPOSITION COMPRISING A LIQUID THIOCARBAMATE HERBICIDE, A SOLID HERBICIDE, SURFACTANT, AND DRY PROCESS SILICIC ACID

Susumu Katou, Shizuoka, and Kanji Nakamura, Shimizu, both of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/00655, § 371 Date Dec. 31, 1990, § 102(e) Date Dec. 31, 1990, PCT Pub. No. WO90/14010, PCT Pub. Date Nov. 29, 1990

PCT Filed May 23, 1990, Ser. No. 623,658

Claims priority, application Japan, May 23, 1989, 1-129284

Int. Cl.[5] A01N *43/34, 43/54, 37/00, 25/22*

U.S. Cl. 504—136 **5 Claims**

1. A complex suspended herbicide formulation comprising:

a herbicidally effective amount of an active ingredient of thiolcarbamate type which is liquid at common temperature;

a solid, herbicidally effective amount of an active ingredient which is slightly soluble in said herbicidally active ingredient of thiolcarbamate type at common temperature;

a surfactant; and

a dry process white carbon;

wherein said solid herbicidally active ingredient is dispersed and suspended in said herbicidally active ingredient of thiolcarbamate type in the presence of said surfactant and said dry process white carbon.

5,180,417

4-((ARYLOXY)PHENOXY)FLUOROALKANOIC ACID DERIVATIVES AND THEIR HERBICIDAL USES

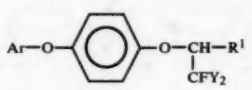
James A. Turner, Pleasant Hill, Calif., assignor to DowElanco, Indianapolis, Ind.

Division of Ser. No. 377,697, Jul. 10, 1989, Pat. No. 5,032,168. This application Apr. 12, 1991, Ser. No. 684,703

Int. Cl.[5] C01D *471/02;* **A01N** *43/00*

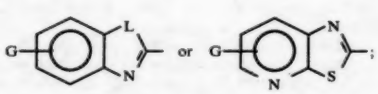
U.S. Cl. 504—246 **12 Claims**

1. A compound or an optical isomer thereof corresponding to the formula



wherein

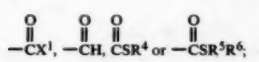
Ar represents



each Y independently represents —H or —F;

G represents, in the 5 or 6 ring position, —Br, —Cl, —F or $—CF_3$;

R^1 represents $—CH_2OH$, —CN, —COOH, —COOM $—COOR^2$,



X^1 represents —Br or —Cl;

L represents oxygen or sulfur;

M represents an agriculturally acceptable cation;

R^2 represents C_1–C_{12} alkyl, C_3–C_{12} alkenyl, C_3–C_{12} alkynyl, C_3–C_{12} cycloalkyl, C_1–C_{12} alkyl substituted with 1 or 2 bromo, chloro, fluoro or C_1–C_4 alkoxy substituents or R^2 represents phenyl substituted with 1 or 2 bromo, chloro, fluoro, C_1–C_4 alkyl, C_1–C_4 alkoxy or nitro substituents or R^2 represents the radical $—N=C(R^3)_2$ wherein each R^3 independently represents a C_1–C_4 alkyl;

R^4 represents C_1–C_{12} alkyl, C_3–C_{12} alkenyl, C_3–C_{12} alkynyl, C_3–C_{12} cycloalkyl phenyl or phenyl substituted with 1 or 2 bromo, chloro, fluoro, C_1–C_4 alkyl, C_1–C_4 alkoxy or nitro groups;

R^5 represents hydrogen, C_1–C_{12} alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_3–C_4 cycloalkyl, —CN $—SO_2CH_3$, $—OR^2$ wherein R^7 is hydrogen or C_1–C_4 alkyl, $—NHR^7$, phenyl or phenyl substituted with 1 or 2 bromo, chloro, fluoro, C_1–C_4 alkyl, C_1–C_4 alkoxy or nitro groups; and

R^6 represents hydrogen, methyl, ethyl, C_3 alkenyl, C_3 alkynyl or cyclopropyl.

5,180,418

HERBICIDALLY ACTIVE THIADIAZABICYCLONONANES AND NONENES

Georg Pissiotas, Lörrach, Fed. Rep. of Germany; Hans Moser, Magden, Switzerland; Hans-Georg Brunner, Lausen, Switzerland, and Eginhard Steiner, Füllinsdorf, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

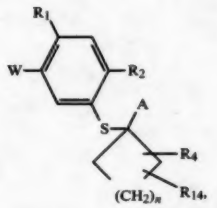
Filed Jul. 19, 1991, Ser. No. 732,988

Claims priority, application Switzerland, Jul. 23, 1990, 2439/90

Int. Cl.[5] A01N *43/82;* **C07D** *513/04*

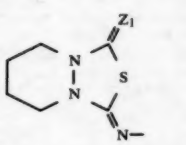
U.S. Cl. 504—193 **20 Claims**

1. A cycloalkanecarboxylic acid compound of the formula I



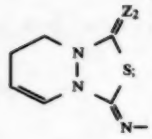
(I)

wherein W is



(W_8)

-continued



(W9)

and

A is CO—R_3 or CN;

R_1 is hydrogen or fluorine;

R_2 is halogen or cyano;

R_3 is chlorine, X—R_5, amino, C_1–C_4alkylamino, di-C_1–C_4alkylamino, C_2–C_4haloalkylamino, di-C_2–C_4haloalkylamino, C_1–C_4hydroxyalkylamino, di-C_1–C_4hydroxyalkylamino, C_3–C_4alkenylamino, diallylamino, —N-pyrrolidino, —N-piperidino, —N-morpholino, —N-thiomorpholino, —N-piperidazino, the group —O—N=C—(R_9)R_{10} or the group —N—R_6(OR_6); each of R_4 and R_{14}, independently of the other, is hydrogen, fluorine, chlorine, bromine, C_1–C_4alkyl or trifluoromethyl;

R_5 is hydrogen, C_1–C_{10}alkyl, C_1–C_4alkoxy-C_1–C_4alkyl, halo-C_1–C_8alkyl, C_1–C_{10}alkylthio-C_1–C_4alkyl, di-C_1–C_4alkylamino-C_1–C_4alkyl, cyano-C_1–C_8alkyl, C_3–C_8alkenyl, halo-C_3–C_8alkenyl, C_3–C_8alkynyl, C_3–C_7cycloalkyl, C_3–C_7cycloalkyl-C_1–C_4alkyl or halo-C_3–C_7cycloalkyl, or benzyl which is unsubstituted or substituted at the phenyl ring by up to three identical or different substituents selected from the group consisting of halogen, C_1–C_4alkyl, halo-C_1–C_4alkyl, halo-C_1–C_4alkoxy and C_1–C_4alkoxy,

or is an alkali metal ion, an alkaline earth metal ion or an ammonium ion, the group —CHR_6—$(CH_2)_m$—$COOR_7$, or the group —CHR_6—$(CH_2)_t$—$Si(R_8)_3$;

R_6 is hydrogen or C_1–C_4alkyl;

R_7 is hydrogen, C_1–C_6alkyl, C_3–C_8alkenyl, C_3–C_8alkynyl, C_1–C_8alkoxy-C_2–C_8alkyl, C_1–C_8alkylthio-C_2–C_8alkyl or C_3–C_7cycloalkyl;

R_8 is C_1–C_4alkyl;

R_9 is C_1–C_4alkyl;

R_{10} is C_1–C_4alkyl or phenyl;

or R_9 and R_{10}, together with the carbon atom to which they are bonded, form a cyclohexane ring;

R_{11} is C_1–C_8alkyl;

R_{12} is hydrogen or C_1–C_8alkyl;

R_{13} is hydrogen, C_1–C_6alkyl, C_3–C_7cycloalkyl, C_1–C_4alkoxy-C_1–C_4alkyl, C_1–C_4alkylthio-C_1–C_4alkyl, halo-C_1–C_7alkyl, C_3–C_7alkenyl or C_3–C_7alkynyl;

X is oxygen or sulfur;

Z_1 is oxygen or sulfur;

Z_2 is oxygen or sulfur;

n is 0, 1, 2, 3 or 4;

m is 0, 1, 2, 3 or 4;

q is 1 or 2; and

t is 0, 1, 2, 3 or 4,

or an agriculturally acceptable salt thereof.

5,180,419

HERBICIDAL 2-(2-IMIDAZOLIN-2-YL)-BENZO-(5-MEMBERED)-HETEROCYCLES AND THE USE THEREOF

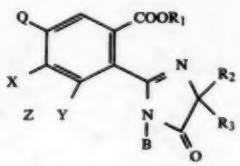
David M. Gange, Princeton; Michael A. Guaciaro, Hightstown, and Robert F. Doehner, Jr., East Windsor, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 576,645, Aug. 31, 1990, abandoned. This application Nov. 22, 1991, Ser. No. 797,479

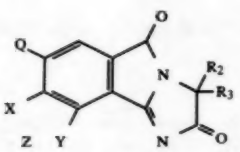
Int. Cl.[5] **A01N** *43/90, 43/76, 43/50;* **C07D** *233/70, 235/00, 263/56, 263/58*

U.S. Cl. 504—276 **16 Claims**

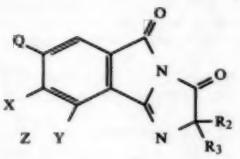
1. A compound having the structure



a.



b.



c.

wherein

R_1 is hydrogen, di(C_1–C_4)alkylimino,

C_1–C_{12} alkyl optionally substituted with one to three of the following: C_1–C_4 alkoxy, C_1–C_4 alkylthio, halogen, hydroxy, C_3–C_6 cycloalkyl, benzyloxy, furyl, phenyl, optionally substituted with one nitro, one to three halogens, C_1–C_4 alkyl groups or C_1–C_4 alkoxy groups, carboxy, C_1–C_4 alkoxycarbonyl, cyano or tri(C_1–C_4)alkylammonium halide,

C_3–C_{12} alkenyl optionally substituted with one to three of the following: C_1–C_4 alkoxy, phenyl, halogen or C_1–C_4 alkoxycarbonyl,

C_3–C_6 cycloalkyl optionally substituted with one to three C_1–C_4 alkyl groups,

C_3–C_{16} alkyl optionally substituted with one to three C_1–C_3 alkyl groups or

a cation;

R_2 is C_1–C_4 alkyl;

R_3 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl, and when R_2 and R_3 are taken together with the carbon to which they are attached they may represent C_3–C_6 cycloalkyl optionally substituted with methyl;

B is hydrogen, COR_4 or SO_2R_5 with the proviso that when B is COR_4 or SO_2R_5, R_3 is other than hydrogen or a cation;

R_4 is C_1–C_{11} alkyl, chloromethyl or phenyl optionally substituted with halogen, nitro or C_1–C_4 alkyl;

R_5 is C_1–C_4 alkyl or phenyl optionally substituted with C_1–C_4 alkyl;

X, Y and Z are each independently CR_6,CR_7R_8, NR_9, N O or S with the provisos that at least one of X, Y and Z must be O or S, at least one of X, Y and Z must be CR_6 or CR_7R_8, when X or Y are O or S, then Z cannot be O or S and when X and Y are both O and Z is CR_7R_8, the structure must be a, c or e;

the configuration represents either a single bond or a double bond with the proviso that when any of X, Y or Z is CR_7R_8, NR_9, O or s, then the configuration attached thereto represents a single bond and with the further proviso that at least one of the configurations represents a single bond;

R_6, R_7 and R_8 are each independently hydrogen, halogen, C_1–C_4 alkoxy or C_1–C_4 alkyl optionally substituted with one hydroxy or one to three halogens, C_1–C_4 alkoxy groups, or C_1–C_4 alkylthio groups;

R_9 is hydrogen or C_1–C_4 alkyl optionally substituted with one

hydroxy or one to three halogens, C_1–C_4 alkoxy groups or C_1–C_4 alkylthio groups;

Q is hydrogen, halogen, C_1–C_4 alkoxy or C_1–C_4 alkyl optionally substituted with one or more of the following: halogen, C_1–C_4 alkoxy, C_1–C_4 alkylthio, or C_2–C_4 alkenyl;

the optical isomers thereof when R_2 and R_3 are not the same or when R_7 and R_8 are not the same;

the tautomers and geometric isomers thereof and the acid addition salts thereof except when R_1 is a salt forming cation.

5,180,420

WATER DISPERSIBLE GRANULES

Yasuyuki Katayama, Takarazuka; Yasuhiko Ishimoto, Nishinomiya; Fumio Horide, Ikeda; Shigenori Tsuda, Kyoto, and Fumio Nishioka, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 11, 1991, Ser. No. 667,759

Claims priority, application Japan, Mar. 15, 1990, 2-065774

Int. Cl.[5] A01N *43/653*

U.S. Cl. 504—116 **7 Claims**

1. A water dispersible granule comprising:

(a) 10 to 70% by weight of a pesticidally active ingredient which is solid at room temperature,

(b) 5 to 25% by weight of an anionic surface active agent, and

(c) 10 to 80% by weight of a kaolin clay having a volume median diameter of 2 μm or more.

5,180,421

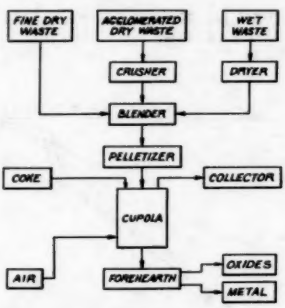
METHOD AND APPARATUS FOR RECOVERING USEFUL PRODUCTS FROM WASTE STREAMS

William Rostoker, deceased, late of Homewood, Ill. by Gareth Rostoker, executor ; Gareth Rostoker, Glenwood, Ill.; Julius J. Bonini, Munster, Ind., and Gary W. Klimczak, Lemont, Ill., assignors to Rostoker, Inc., Burnham, Ill.

Filed Mar. 11, 1991, Ser. No. 667,107

Int. Cl.[5] C22B *1/16*

U.S. Cl. 75—414 **29 Claims**



1. A method for recovering useful materials from solid streams comprising the steps of:

(a) mixing a plurality of solid waste streams in such proportions that the amounts of the combined A, B and C components of the mixture are within the area enclosed by lines joining points, a, b, C, g and h in FIG. 1 and that they form a composite that becomes molten and pourable below about 1600° C.;

(b) heating the mixture obtained in step (a) to a temperature sufficient to cause fusion thereof to form a molten and purable solution of oxides; and

(c) cooling said solution of oxides to form a stable solid, useful as a filler,

wherein A is the sum of the percentages by weight of the sodium, potassium, calcium, barium, boron and phosphorus compounds in the mixture measured as their oxides, wherein B is the sum of the percentages by weight of the silicon and aluminum compounds in the mixture measured as their oxides, and wherein C is the sum of the percentages by weight of the iron, copper, nickel, cobalt, zinc, lead, titanium, manganese, cadmium, vanadium, arsenic, magnesium, chromium, tin, tantalum, silver and zirconium compounds in the mixture measured as their oxides.

5,180,422

COPPER SMELTING PROCESS

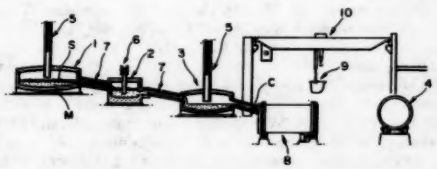
Nobuo Kikumoto, Tokyo, and Mineo Hayashi, Kagawa, both of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Nov. 20, 1991, Ser. No. 795,343

Claims priority, application Japan, Nov. 20, 1990, 2-314672

Int. Cl.[5] C22B *15/00*

U.S. Cl. 75—644 **4 Claims**



1. A copper smelting process comprising the steps of:

smelting copper concentrate in a furnace to produce copper;

treating flue gas discharged from said furnace to produce sulfuric acid;

treating waste liquid discharged during the production of the sulfuric acid to produce gypsum; and

introducing said gypsum into said furnace as a flux.

5,180,423

CONVERTER AND METHOD FOR TOP BLOWING NONFERROUS METAL

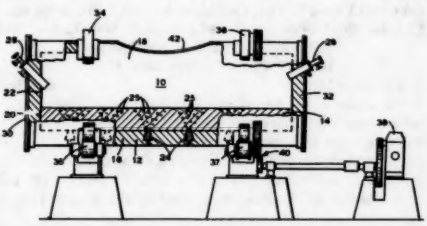
Samuel W. Marcuson, Sudbury; Carlos A. Landolt, Lively; James H. Amson, Sudbury, and Haydn Davies, Fonthill, all of Canada, assignors to INCO Limited, Toronto, Canada

Filed Mar. 4, 1992, Ser. No. 845,642

Claims priority, application Canada, Apr. 26, 1991, 2041297

Int. Cl.[5] C21C *5/34*

U.S. Cl. 75—649 **18 Claims**



1. A converter for purifying nonferrous materials by top blowing a gas containing oxygen in combination with bottom sparging comprising:

a converter body for smelting a molten nonferrous material, said converter body having a refractory lined chamber, said chamber having a lower portion for holding said nonferrous material and an upper portion above said lower portion,

a gas injector means piercing said lower portion for bottom sparging said nonferrous material with a gas selected from a group consisting of inert gases and reducing gases, and

a lance piercing said upper portion of said converter body in

a location distally spaced from a highest temperature region of said converter during smelting, said location having a temperature at least 25% cooler during smelting than temperature of said nonferrous material in degrees Kelvin when a supplemental burner is not being operated, said lance being connectable to an oxidizing gas supply for directing oxidizing gas to bottom sparged nonferrous material and oxidizing at least one impurity from the nonferrous material, said lance projecting minimally into said chamber for limiting exposure of said lance to adverse conditions within said upper portion of said converter body.

5,180,424

MICHAEL ADDITION AMINOPOLYESTER RESINS AS DILUTION EXTENDERS FOR ZINC-CONTAINING METAL RESINATE INKS

G. Frederick Hutter, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 772,228, Oct. 7, 1991, abandoned. This application May 18, 1992, Ser. No. 884,916

Int. Cl.[5] C09D *11/00*

U.S. Cl. 106—20 R **5 Claims**

1. A printing ink comprising a zinc-containing metal resinate complexed with an aminopolyester that is soluble in either aliphatic or aromatic hydrocarbons; said aminopolyester being prepared as the Michael addition reaction product of:

(a) a polyamine wherein the polyamine is a member selected from the group consisting of aminoethylpiperazine, 1,2-diaminocyclohexane, 3-dimethylaminopropylamine, N,N[1]-dimethylethylenediamine, 2-methyl-1,5-pentanediamine, ethylenediamine, isophoronediamine, bis(4-aminocyclohexyl) methane, piperazine, and combinations thereof; and

(b) an acrylic ester wherein the acrylic ester is a member selected from the group consisting of hexanediol diacrylate, trimethylolpropane triacrylate, tripropylene glycol diacrylate, and combinations thereof;

where the ratio of the reactants is such that the equivalent weight of the primary and secondary amine groups per the equivalent weight of acrylic unsaturation is in the range of 0.8–1.4.

5,180,425

AQUEOUS INK JET INKS CONTAINING POLYOL/ALKYLENE OXIDE CONDENSATES AS COSOLVENTS

Howard Matrick, Highlands, N.J.; Michele E. Shepard, Escondido, and Young S. You, Los Altos, both of Calif., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 5, 1991, Ser. No. 788,141

Int. Cl.[5] C09D *11/00*; C08K *5/00*

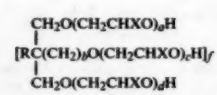
U.S. Cl. 106—22 R **43 Claims**

1. An aqueous ink jet ink composition comprising:

(a) an aqueous carrier medium,

(b) a pigment dispersion or dye; and

(c) a cosolvent which is a polyol/alkylene oxide condensate having a solubility in water of at least 4.5 parts in 100 parts of water at 25° C. and represented by the general formula:



wherein X=—H or —CH_3;

R=—H, —CH_3, —C_2H_5, —C_3H_7, —C_4H_9, or —$CH_2O(CH_2CH_2O)_eH$;

b=0 or 1;

a+d+f(c+e)=2–100; and

f=1–6, the cosolvent being present in the amount of at least 4.5% to 70% based on the total weight of the ink jet ink composition.

5,180,426

COMPOSITION FOR FORMING CALCIUM PHOSPHATE TYPE SETTING MATERIAL AND PROCESS FOR PRODUCING SETTING MATERIAL

Masaya Sumita, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 291,040, Dec. 28, 1988, abandoned, which is a continuation-in-part of Ser. No. 217,030, Jul. 11, 1988, abandoned. This application Nov. 4, 1991, Ser. No. 785,260

Claims priority, application Japan, Dec. 28, 1987, 62-332904; Jun. 22, 1988, 63-153730

Int. Cl.[5] C09K *3/00*

U.S. Cl. 106—35 **29 Claims**

1. A composition for forming a calcium phosphate setting material comprising

(1) powder comprising at least one of α-tricalcium phosphate and tetracalcium phosphate; and

(2) a setting solution comprising an aqueous acidic solution having dissolved therein at least one polysaccharide selected from the group consisting of carboxymethyl chitin, glycol chitin, pullulan, high methoxy-pectin and chitosan in such an amount that said setting solution has a viscosity at room temperature of 70 cp or more.

5,180,427

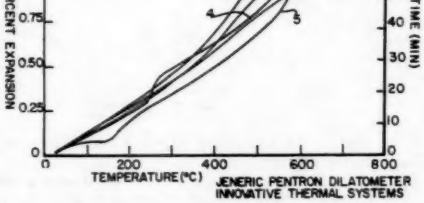
FILLERS FOR INVESTMENT AND REFRACTORY DIE MATERIALS

Arun Prasad, Cheshire, Conn., and Carlino Panzera, Belle Mead, N.J., assignors to Jeneric/Pentron, Inc., Wallingford, Conn.

Filed Jan. 28, 1992, Ser. No. 827,150

Int. Cl.[5] C09K *3/00*; B28B *7/28*

U.S. Cl. 106—35 **18 Claims**



1. An investment and refractory die material upon which a dental porcelain or alloy is heated, said investment and refractory die material comprising by weight:

(A) about 50 to about 80 percent filler, said filler containing greater than about 50 percent by weight based on said filler of at least one member selected from the group consisting of leucite and calcium difluoride; and

(B) about 20 to about 50 percent of a phosphate-containing binder, wherein the thermal expansion of said investment and refractory die material is greater than about 0.8 percent when heated from about 25° C. to about 500° c.

5,180,428

IN SITU REJUVENATION OF AGED AND CRACKED ASPHALT PAVEMENT

Richard D. Koleas, 1015 S. Freeway, Tucson, Ariz. 85745

Continuation of Ser. No. 587,327, Sep. 24, 1990, abandoned. This application Dec. 24, 1991, Ser. No. 814,066
Int. Cl.[5] C08L *95/00*
U.S. Cl. 106—277 4 Claims

1. A liquid modifier for topical application to in-situ aged asphalt pavement, said modifier being an emulsion and consisting essentially of the following components:

a. a predominantly asphaltene asphalt;

b. a predominantly maltene recycling agent;

c. a rubbery polymer or latex selected from the group consisting of styrene-butadiene-styrene, styrene butadiene rubber, neophrene latex, and natural rubber, and combinations of one or more of them;

d. an emulsifier

e. water

said emulsion being a flowable liquid so as readily to be poured onto a surface and brushed or wiped onto and into it, and readily to flow into and penetrate small cracks in the pavement, and when the water has evaporated, to form a structural bridge and bond between opposed faces of the cracks, and also to penetrate into the original asphalt pavement through said faces to improve its properties all without lifting or reprocessing the aged asphalt.

5,180,429

MAGNESIA CONCRETE

Robert M. Khasanov, Krasnogorsk, U.S.S.R., assignor to Steven M. Lasell, Ashland, Oreg.

Filed Nov. 22, 1991, Ser. No. 796,343
Int. Cl.[5] C04B *9/02*
U.S. Cl. 106—685 2 Claims

1. A magnesium concrete comprising:

magnesium oxide in about 100 parts; magnesium chloride in a range of about 40 to about 80 parts; mineral aggregates in a range of about 300 to about 500 parts; sublimates of carnallite chlorates in a range of about 20 to about 40 parts; and sodium siliceous-fluoride in a range of about 1 to about 2 parts.

5,180,430

CONCRETE SURFACE AIR VOID REDUCTION ADMIXTURE

Ellis M. Gartner, Silver Spring, and Chiara F. Ferraris, Columbia, both of Md., assignors to W.R. Grace & Co.-Conn., New York, N.Y.

Filed Oct. 16, 1991, Ser. No. 777,854
Int. Cl.[5] C04B *24/10*
U.S. Cl. 106—730 4 Claims

1. A process for inhibiting formation of surface voids of concrete structural unit comprising

mixing a concrete composition composed of hydraulic cement, small aggregate, large aggregate and water with a combination of a cement water-reducing agent and Welan gum and, based on the hydraulic cement of said concrete composition, said water-reducing agent being present in from about 0.3 to 1 weight percent and said Welan Gum being present in from about 0.001 to 0.01 weight percent;

casting said concrete composition into a mold capable of forming a shaped structure and having concrete-to-mold surface contact;

curing said concrete composition while contained within the mold; and

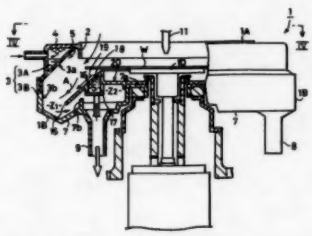
removing the mold to retrieve a cured shaped concrete structural unit which is substantially free of large surface voids on surfaces in contact with the mold during casting and curing.

5,180,431

APPARATUS FOR APPLYING LIQUID AGENT ON SURFACE OF ROTATING SUBSTRATE

Kenji Sugimoto, and Mitsuhiro Fujita, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jun. 14, 1990, Ser. No. 538,239
Claims priority, application Japan, Jun. 14, 1989, 1-70199[U]
Int. Cl.[5] B05C *11/02*
U.S. Cl. 118—52 6 Claims



1. An apparatus for applying liquid agent to a substrate, said apparatus comprising:

(a) means for supporting and rotating a substrate about a spin axis;

(b) means for applying liquid agent to said substrate;

(c) a cup member for preventing liquid agent from scattering, said cup member including a circumferential wall having an inner circumferential surface and an outer circumferential surface, said circumferential wall forming a generally conical surface having an upper portion, said upper portion including a plurality of openings, each of said openings extending through said circumferential wall and being slightly slanted with respect to a direction tangent to the inner surface of the circumferential wall;

(d) first cleaning agent supplying means for supplying cleaning agent to said inner circumferential surface through said openings, said cleaning agent supplying means being integrally formed on said outer circumferential surface of said circumferential wall;

(e) a slanted member with a slanted upper surface for regulating and guiding air, liquid agent and cleaning agent downwardly through said cup member, said slanted surface being located below said supporting means, said slanted surface including an upper portion with a plurality of openings formed therein, said slanted member having a rear surface and a lower edge, each of said openings formed in said upper portion of said slanted surface extending through said slanted member and being slightly slanted with respect to a direction tangent to the slanted surface; and

(f) second cleaning agent supplying means for supplying cleaning agent to said slanted surface by supplying cleaning agent through said openings of said slanted surface, said second cleaning agent supplying means being formed on said rear surface of said slanted member;

wherein said apparatus includes fine irregularities on said inner circumferential surface for spreading cleaning agent.

5,180,432

APPARATUS FOR CONDUCTING A REFRACTORY METAL DEPOSITION PROCESS

Keith J. Hansen, San Jose, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

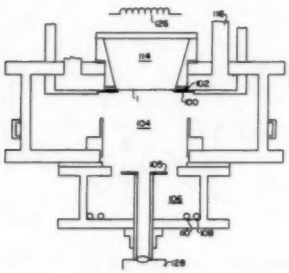
Division of Ser. No. 461,959, Jan. 8, 1990, abandoned. This application Oct. 2, 1990, Ser. No. 592,014
Int. Cl.[5] C23C *16/46*
U.S. Cl. 118—697 6 Claims

1. An apparatus for forming a barrier layer for electrically

contacting a conductive interconnect layer to one or more exposed N and P type silicon regions on a wafer, said apparatus comprising:

means for forming an optically opaque layer of refractory metal on said exposed N and P type silicon regions prior to a temperature of said regions exceeding approximately 100° C.;

means for heating said wafer in a CVD chamber at a substantially constant deposition temperature while supplying an amount of reducing gas and an amount of refractory metal based gas for a time to form a barrier layer having a desired thickness;



means for annealing said wafer to form a silicide at an interface of said refractory metal and said silicon regions; and

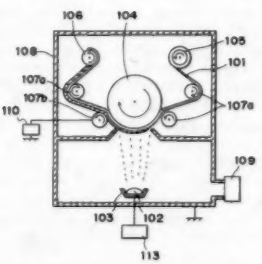
means programmed for automatically controlling said means for forming, said means for heating, and said means for annealing.

5,180,433

EVAPORATION APPARATUS

Akira Okuda, Sakai, and Yoshikazu Yoshida, Izumi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 4, 1992, Ser. No. 846,687
Claims priority, application Japan, Mar. 5, 1991, 3-38331
Int. Cl.[5] C23C *14/24*
U.S. Cl. 118—718 **3 Claims**



1. An evaporation apparatus comprising:

a vacuum chamber;

a vacuum pump for producing a pressure-reduced atmosphere in the vacuum chamber;

at least one vacuum evaporation source for evaporating an evaporation material provided in the vacuum chamber;

a can, opposed to the vacuum evaporation source and rotating and ungrounded, for cooling a film on which the evaporation material is to be deposited;

a supply roller for supplying the film to the can;

a winding roller for winding the film on which the evaporation material has been deposited;

a voltage-applying roller for assisting the winding and travel of the film and bringing into contact with a deposited material on the film; and

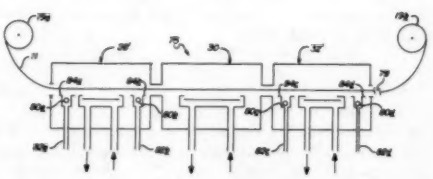
voltage applying means for applying a DC voltage to the film, on which the evaporation material has been deposited, through the voltage-applying roller to generate potential difference between the film and the can.

5,180,434

INTERFACIAL PLASMA BARS FOR PHOTOVOLTAIC DEPOSITION APPARATUS

Gary M. DiDio, Highland; Kermit Jones, Rochester; Kevin Hoffman, Sterling Heights; Timothy Laarman, Almont; Jon Call, Royal Oak, and Prem Nath, Rochester Hills, all of Mich., assignors to United Solar Systems Corporation, Troy, Mich.

Filed Mar. 11, 1991, Ser. No. 667,262
Int. Cl.[5] C23C *16/50, 16/54*
U.S. Cl. 118—718 **14 Claims**



1. In a multiple chamber glow discharge apparatus of the type comprising a plurality of deposition chambers and means for continuously transporting an elongated web of substrate material along a path of travel passing through said deposition chambers in sequence, wherein each deposition chamber includes: a process gas conduit for introducing a process gas; a cathode; a source of electromagnetic power in electrical communication with the cathode; and means for confining the process gas in a cathode region of the chamber, wherein electromagnetic energy which is supplied to said cathode by said source disassociates the process gas and creates a process gas plasma therefrom in said cathode region, wherein the improvement comprises in combination:

a plasma bar assembly disposed in one of said deposition chambers, along the path of travel of said web of substrate material, said plasma bar assembly comprising:

a plasma bar;

a shield disposed so as to substantially enclose the plasma bar and to define a cleaning/passivation region proximate thereto;

a conduit for introducing a cleaning/passivation gas, said conduit being in communication with said shield and separate from said process gas conduit, said shield disposed in close proximity to said substrate so as to confine the cleaning/passivation gas in the cleaning/passivation region and to exclude entry of the process gas into the cleaning/passivation region; and

means for supplying electromagnetic power to said plasma bar, so as to dissociate said cleaning/passivation gas and create a plasma therefrom in said cleaning/passivation region.

5,180,435

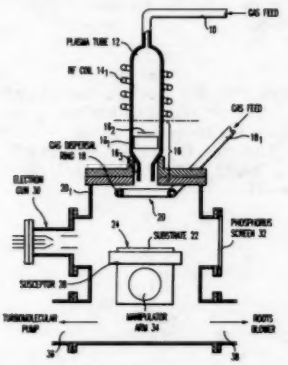
REMOTE PLASMA ENHANCED CVD METHOD AND APPARATUS FOR GROWING AN EPITAXIAL SEMICONDUCTOR LAYER

Robert J. Markunas, Chapel Hill; Robert Hendry, Hillsborough, and Ronald A. Rudder, Cary, all of N.C., assignors to Research Triangle Institute, Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 375,949, Aug. 10, 1989, Pat. No. 5,018,479, which is a division of Ser. No. 100,477, Sep. 24, 1987, Pat. No. 4,870,030. This application Oct. 29, 1990, Ser. No. 604,245

Int. Cl.[5] C23C *16/48*

U.S. Cl. 118—723 10 Claims



1. A chemical vapor deposition apparatus for growing a layer on a substrate, comprising:

activation means for activating a feed gas by increasing the chemical reactivity of said feed gas, including means for introducing said feed gas to an inlet of said activation means at a predetermined flow velocity,

means for imparting energy to said feed gas in an activation region thereby producing an activated feed gas composed of plural reactive species, and

an exit plane from which the activated feed gas exits the activation region;

spatial filtering means in communication with said exit plane for passing only selected of said reactive species of activated feed gas based on the lifetime of said selected of said reactive species;

a deposition chamber located downstream of and in communication with said spatial filtering means, comprising,

carrier gas introduction means for introducing a carrier gas including a constituent element of the layer to be deposited at a predetermined flow velocity into a carrier gas mixing region where said carrier gas is mixed with said selected reactive species of said activated feed gas to transfer energy from said selected activated species and partially dissociate and activate said carrier gas into plural reactive species of said carrier gas,

a deposition region in which said substrate is positioned located downstream from said carrier gas mixing region;

wherein the flow rates of said feed and carrier gases are selected so that no back-diffusion of carrier gas and reactive species of said feed and carrier gases upstream of said exit plane occurs;

wherein selected reactive species of the activated feed gas activate the carrier gas and form activated species of the carrier gas, the activated carrier gas species being ordered and further dissociated through subsequent reactions with said selected reactive species of the activated feed gas on said substrate.

5,180,436

MICROWAVE PLASMA FILM DEPOSITION SYSTEM

Tetsuya Ueda; Naoki Suzuki, and Kohsaku Yano, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 384,699, Jul. 25, 1989, Pat. No. 5,125,358. This application Dec. 18, 1991, Ser. No. 809,119

Claims priority, application Japan, Jul. 26, 1988, 63-185964; Sep. 29, 1988, 63-244906

Int. Cl.[5] C23C *16/48, 16/50*

U.S. Cl. 118—723 5 Claims

1. A microwave plasma film deposition system, comprising:

a coaxial waveguide for feeding microwaves by way of a microwave feeding window provided at an end thereof, the difference between the inside radius of a cylindrical external conductor and the radius of an inner conductor of said coaxial waveguide being arranged to be shorter than the mean free path of an electron of the gas in said coaxial waveguide;

a plasma cavity in communication with another end of said waveguide and further having a discharge gas inlet which is not in communication with said waveguide;

a specimen chamber in communication with said plasma cavity and having a substrate setting rest therein and a material gas inlet; and

magnetic field applying means provided near said plasma cavity for generating plasma in said plasma cavity, the strength B (Tesla) of the magnetic field near said microwave feeding window satisfying the following conditions:

$$B < (1/r)\sqrt{(2mT/e}$$

where 2r' designates the difference between the inside radius of the cylindrical external conductor and the radius of the inner conductor of said coaxial waveguide; m (kg) represents the mass of the electron; e (C) depicts the electric charge of the electron; and T (eV) is the energy sufficient to ionize the gas.

5,180,437

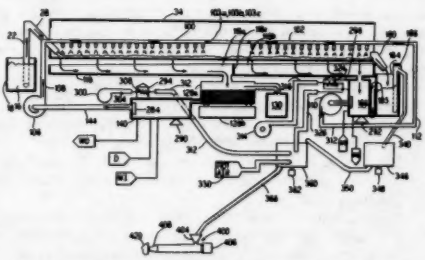
MACHINE FOR WASHING PLASTIC FRAGMENTS TO PREPARE THEM FOR RECYCLING

Robert M. Anderson, P.O. Box 174, Rover, Ark. 72860; John E. Vining, Sr., P.O. Box 158, Sondheimer, La. 71276, and Lloyd L. Patton, Sr., 100 Willow Glen Dr., Vicksburg, Miss. 39180

Division of Ser. No. 633,795, Dec. 26, 1990, abandoned. This application Nov. 14, 1991, Ser. No. 791,346

Int. Cl.[5] B08B *3/00, 3/04, 3/14*

U.S. Cl. 134—10 12 Claims



1. The method for cleaning and preparing plastic fragments, the fragments created from plastic material having paper adhered thereto for recycling which includes the steps of:

1. fragmenting plastic material of different types with uniformly sized particles sized in the range of ½ inch (95 mm) to ¼ inch (127 mm),

2. driving a supply of said particles in the form of a continu-

ous circumferentially confined longitudinally extending stream,

3. at one point in the stream directing a flow of washing liquid against the particles to wash paper from the plastic particles,

4. at a second point in the stream downstream of said first point directing a flow of liquid rinse water against the particles to rinse the particles,

5. at a third point in the stream downstream of the second point drying some washed and rinsed particles for use at a recycling site.

5,180,438

CLEANING AND DRYING SYSTEM

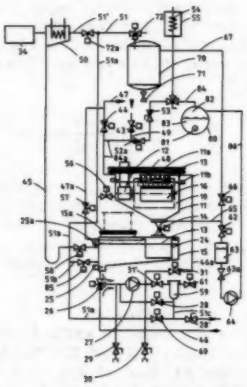
Jurgen Hockh, Neuenburg, and Franz Koppelhuber, Otisheim, both of Fed. Rep. of Germany, assignors to Hockh Metall-Reinigungsanlagen GmbH, Neuenburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 419,949, Oct. 11, 1989, abandoned. This application Jun. 4, 1991, Ser. No. 709,831

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1990, 9013241[U]

Int. Cl.[5] **B08B** *3/00, 5/04*

U.S. Cl. 134—21 **10 Claims**



1. A process for washing and drying stock consisting of discrete metal objects in a system composed of: an aqueous washing fluid circuit including a washing fluid reservoir for holding an aqueous washing fluid constituted by hot water and at least one washing vessel connected to receive the washing fluid from the reservoir; a stock carrier contained in the washing vessel to support the stock; an underpressure container; a vacuum pump; and connection means including conduits and valve means connected for controlling communication among the pump, the underpressure container and the washing vessel, said process comprising:

a washing phase for washing the stock including:

supporting stock in the stock carrier in the washing vessel;

operating the washing fluid circuit to bring washing fluid into contact with stock in the washing vessel and maintaining the washing fluid in contact with the stock for a sufficient time to heat the stock and to effect cleaning of the stock; and

a phase including: connecting the underpressure container to the pump whereby the washing vessel is isolated from the pump and from the underpressure container, and operating the pump to place the underpressure container under a vacuum pressure substantially below atmospheric; and

a drying phase beginning at a time when the washing fluid is drained from the washing vessel, the temperature of the stock is substantially at the temperature of the washing fluid, the pressure in the washing vessel is substantially atmospheric, and the underpressure container is at the vacuum pressure; and including: abruptly placing the valve means in a first state in which the underpressure container is connected to the washing vessel for producing an abrupt pressure drop, resulting in a vacuum shock in the washing vessel and across the entirety of the surfaces of the stock and to achieve pressure equalization between the washing vessel and the underpressure container; after said step of placing the valve means in a first state placing the valve means in a second state to connect the vacuum pump with the washing vessel and to isolate the vacuum container from the washing vessel and operating the pump until the end of the drying phase to increase continuously the underpressure in the washing vessel, produced by the pressure equalization between the washing vessel and the underpressure container, approximately up to the maximum underpressure attainable by the vacuum pump.

5,180,439

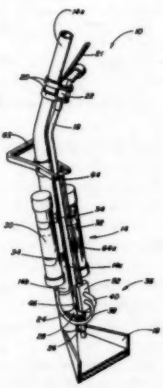
METHOD AND APPARATUS FOR CLEANING & RINSING CARPETS

Steve D. Allison, 921 Sunny La., Raleigh, N.C. 27603

Filed Aug. 1, 1991, Ser. No. 739,250

Int. Cl.[5] **B08B** *3/04;* **A47L** *11/34*

U.S. Cl. 134—21 **10 Claims**



9. A method of cleaning and rinsing a carpet or other surface with a wand comprising the steps of:

(a) loading the wand with both a cleaning and rinsing solution and containing the cleaning and rinsing solutions in separate containers on the wand itself;

(b) directing hot water to the wand and through a hot water line associated with the wand;

(c) cleaning a selected area of the surface by directing cleaning solution from one container on the wand through a control valve into the hot water line to form a cleaning mixture;

(d) dispensing the cleaning mixture onto the selected area to be cleaned and thereafter vacuuming the cleaning mixture from the selected area;

(e) shutting off the flow of cleaning solution into the hot water line associated with the wand;

(f) rinsing residual cleaning solution from the selected surface area with the wand by directing rinsing solution from the other container on the wand through the same control valve into the hot water line to form a rinsing mixture;

(g) dispensing the rinsing mixture onto the selected surface area and therafter vacuuming the rinsing mixture from the selected surface area so as to remove residual cleaning solution from that area; and

(h) shutting off the flow of rinsing solution to the hot water line and repeating the above cleaning and rinsing cycles on other selected surface areas whereby the method enables a carpet or other surface to be cleaned and rinsed by the very same wind in one basic operation.

5,180,440

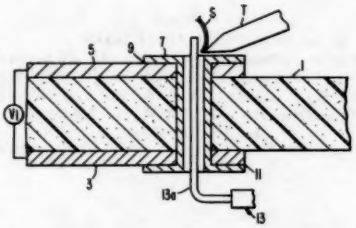
PRINTED CIRCUIT THERMOCOUPLE ARRANGEMENTS FOR PERSONNEL TRAINING AND EQUIPMENT EVALUATION PURPOSES

William J. Siegel; Louis A. Abbagnaro, both of Silver Spring, and William J. Kantter, Columbia, all of Md., assignors to Pace Incorporated, Laurel, Md.

Continuation of Ser. No. 276,432, Nov. 23, 1988, abandoned. This application Jan. 8, 1992, Ser. No. 817,964

Int. Cl.[5] H01L *35/02*

U.S. Cl. 136—230 **19 Claims**



1. Thermocouple arrangement for providing temperature data, resulting from use of at least one thermally affecting process on an electronic assembly via simulated production/-rework/repair operation, comprising an electrically insulative support, a layer of a first conductor material applied on a first surface of said support, at least one printed circuit pattern of a second conductor material, that is dissimilar to said first conductor material, formed on at least one other surface of the support; wherein said printed circuit pattern is comprised of circuitry having thermocouple pad terminal portions, signal monitoring connection portions and trace interconnections running therebetween; wherein at least one thermocouple pad terminal portion of the printed circuit pattern of the second conductor is connected to the layer of the first conductor material by an electrical connection that is formed of said first conductor material and which extends through said support therebetween in a manner creating a thermocouple junction on the respective thermocouple pad terminal portion due to the first conductor material which forms the electrical connection extending through and into overlying relationship with said at least one thermocouple pad portion; wherein said printed circuit pattern of the second conductor material has a plurality of electrically connected terminal portions, and wherein the circuitry for some of said terminal portions is of a different area relative to the area of other of said terminal portions for simulating differing thermal mass configurations.

5,180,441

SOLAR CONCENTRATOR ARRAY

Mickey Cornwall; David M. Peterson, and Theodore G. Stern, all of San Diego, Calif., assignors to General Dynamics Corporation/Space Systems Division, San Diego, Calif.

Filed Jun. 14, 1991, Ser. No. 715,268

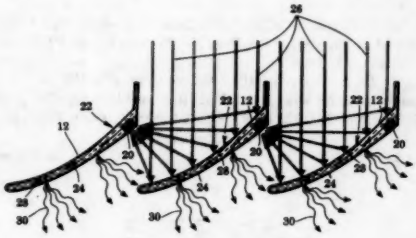
Int. Cl.[5] H01L *31/052*

U.S. Cl. 136—246 **5 Claims**

1. A space efficient solar energy to electrical energy panel array comprising:

two or more adjacent panels having a parabolic reflective surface on one side thereof for receiving solar light energy and a backside opposite to said parabolic reflective surface, said backside including a slot;

a photovoltaic solar energy to electrical energy power cell being positioned in said slot on said backside of each of said two or more adjacent panels so that the outer distal surface of said photovoltaic power cell is flush with said



backside surface forming a smooth continuation thereof, whereby solar energy reflected by said reflective surface is directed to said power cell on the backside of an adjacent panel.

5,180,442

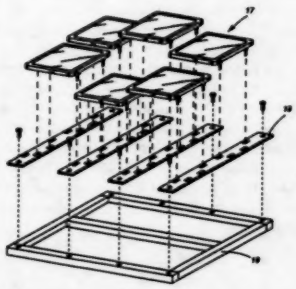
INTEGRATION SYSTEM FOR SOLAR MODULES

Eric Elias, 7414 Herschel Ave. #206, La Jolla, Calif. 92037

Filed Apr. 6, 1992, Ser. No. 863,947

Int. Cl.[5] H01L *31/05*

U.S. Cl. 136—251 **12 Claims**



1. A photovoltaic module integration system comprising:

(a) a rigid supporting frame;

(b) three or more parallel conducting strips, said parallel conducting strips being secured to, and electrically isolated from, said rigid supporting frame;

(c) a plurality of encapsulated photovoltaic module means for converting light into electrical current; and

(d) a plurality of mounting-conducting electrode means for establishing electrical connection to said encapsulated photovoltaic module means and for attaching said encapsulated photovoltaic module means to said parallel conducting strips.

5,180,443

PRESSURE-RELIEF VALVE WITH STEPPED OR DOUBLE PISTON

Richard Voss, Schwerte, Fed. Rep. of Germany, assignor to Richard Voss Grubenausbau GmbH, Schwerte, Fed. Rep. of Germany

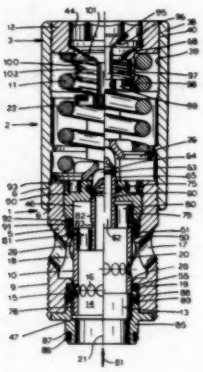
PCT No. PCT/DE90/00332, § 371 Date Mar. 19, 1991, § 102(e) Date Mar. 19, 1991, PCT Pub. No. WO90/14500, PCT Pub. Date Nov. 29, 1990

PCT Filed May 10, 1990, Ser. No. 671,918

Claims priority, application Fed. Rep. of Germany, May 19, 1989, 3916260; Jul. 12, 1989, 3922894; Sep. 1, 1989, 3929094

Int. Cl.[5] F16K *17/04*

U.S. Cl. 137—494 **8 Claims**



1. Pressure-relief valve for the protection of hydraulic units, particularly of hydraulic face support systems in underground mining and tunnel construction against sudden overload due to rock pressure or similar causes, with a valve piston defined by an outer surface arranged to slide in a valve housing against the force of a valve spring and with an inlet opening at a first end of the valve piston provided with a blind bore therethrough and with radial bores that pierce the piston outer surface and with cross bores provided on an inner wall of the valve housing communicable with the radial bores, whereby the valve piston is sealed by an annular ring overridden by the radial bores, wherein the valve piston is formed as a continuous tubular shell with an attachment at a second and remote from the first end serving as control piston having a reduced outer diameter relative to an outer diameter of the tubular shell and with sealing rings lodged in the inner wall of the valve housing both above and below openings defining the cross bores, whereby two separate chambers are defined inside and above the valve piston both subjected to the same pressure and the control piston rests against a spring cap loaded by the force of the valve spring.

5,180,444

METHOD FOR CONTROLLED FLUID QUENCHING OF STEEL

Charles W. Finkl, Evanston, and Nicholas Cerwin, Palatine, both of Ill., assignors to A. Finkl & Sons Co., Chicago, Ill.

Filed Sep. 21, 1988, Ser. No. 247,806

Int. Cl.[5] C21D *1/18*

U.S. Cl. 148—660 **5 Claims**

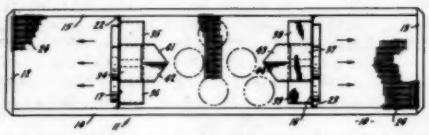
1. In a method of processing a plurality of stationary steel work pieces exposed to the ambient atmosphere, the steps of

disposing a portion of said plurality of work pieces in a first location,

disposing a portion of said plurality of said work pieces in a second location,

subjecting said work pieces in said first location to a draft of forced air moving in a generally vertical direction, and

subjecting said work pieces in said second location to a draft of forced air moving in a generally upward direction,



at least two or more of said work pieces in each location being juxtaposed sufficiently close to one another to be subject to slack quenching in the absence of said draft of forced air.

5,180,445

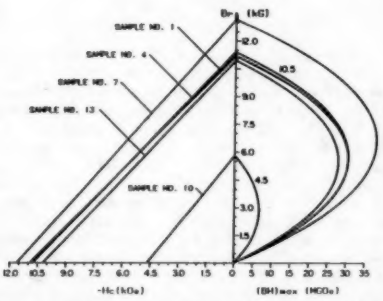
MAGNETIC MATERIALS

Yakov Bogatin, Philadelphia, Pa., assignor to SPS Technologies, Inc., Newtown, Pa.

Division of Ser. No. 365,622, Jun. 13, 1989, Pat. No. 5,114,502. This application Jun. 27, 1991, Ser. No. 722,730

Int. Cl.[5] H01F *1/053*

U.S. Cl. 148—302 **11 Claims**



1. A non-pyrophoric rare earth-containing powder comprising, in atomic percent of the overall composition, from about 12% to about 24% of at least one rare earth element selected form the group consisting of neodymium, praseodymium, lanthanum, cerium, terbium, dysprosium, holmium, erbium, europium, samarium, gadolinium, promethium, thulium, ytterbium, lutetium, yttrium, and scandium, from about 2% to about 28% boron and at least 25% iron, and further having a nitrogen surface concentration of from about 0.4 to about 26.8 atomic percent, wherein said powder has a higher concentration of nitrogen in the surface region than in the center of the powder.

5,180,446

OXIDE-DISPERSION-STRENGTHENED NIOBUM-BASED ALLOYS AND PROCESS FOR PREPARING

Kenji Tsukuta, Chita, and Tomohito Iikubo, Nagoya, both of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Filed Jan. 27, 1992, Ser. No. 826,425

Claims priority, application Japan, Jan. 31, 1991, 3-11185

Int. Cl.[5] C22C *27/02*

U.S. Cl. 148—422 **6 Claims**

1. An oxide-dispersion-strengthened niobium-based alloy with good oxidation resistance and heat resistance, which consists essentially of Al: 12–35 wt. %, Ti: 7–28 wt. %, Cr: 2–10 wt. % and V: 2–10 wt. %, and the balance of Nb, in

which 0.1–2 wt. % of a high melting point metal oxide is dispersed.

5,180,447

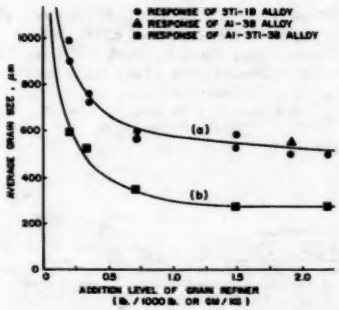
GRAIN REFINER FOR ALUMINUM CONTAINING SILICON

Geoffrey K. Sigworth, Green Lane, Pa., and Matthew M. Guzowski, Bowling Green, Ohio, assignors to KB Alloys, Inc., Sinkingsprings, Pa.

Continuation of Ser. No. 262,124, Oct. 24, 1988, Pat. No. 5,055,256, which is a continuation of Ser. No. 715,328, Mar. 25, 1985, abandoned. This application Aug. 24, 1990, Ser. No. 572,003

Int. Cl.[5] C22C *21/00*

U.S. Cl. 148—437 **7 Claims**



4. A method of making a master alloy capable of grain refining commercial aluminum alloys containing over 1% silicon comprising the steps of:

reacting molten aluminum with a mixture of a titanium-containing salt and a boron-containing salt by stirring said mixture into said aluminum to produce a molten alloy consisting essentially of aluminum, titanium and boron; and

casting said molten alloy to produce said master alloy, wherein the ratio of said titanium-containing salt to said boron-containing salt is such that the Ti:B ratio in said master alloy is between 0.60 to 1.67 and wherein a sufficient amount of said mixture is used to produce a master alloy consisting essentially of, in weight percent, 1.5 to 2.5 titanium, 1.5 to 2.5 boron, and the balance aluminum plus impurities, said master alloy being further characterized by having over 75% of its borides in the form of mixed borides.

5,180,448

METHOD OF LASER HARDENING CORRUGATING ROLLS

Glenn F. Hyde, Timonium, Md., and Gene J. White, Columbus, Ohio, assignors to United Container Machinery Group, Inc., Glen Arm, Md.

Filed Aug. 22, 1990, Ser. No. 570,936

Int. Cl.[5] C21D *1/09*

U.S. Cl. 148—525 **17 Claims**

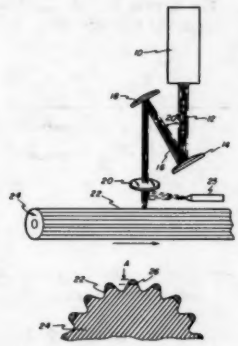
1. A method of heat treating cylindrical corrugating rolls having a plurality of flutes extending along the length thereof, said rolls being formed for use in machinery for manufacturing corrugated paperboard, comprising the steps of:

providing a laser having a Gaussian beam output;

reconfiguring said beam from a Gaussian beam to a beam having a substantially homogeneous power density;

positioning a focusing lens to receive and focus said homogeneous beam to provide a focused beam having a smaller cross-sectional area than the beam emitted by said laser;

positioning a roll to be heat treated so that said focused beam is centered on a spot on one of said plurality of flutes; said spot having a smaller cross-sectional area than the beam emitted by said laser;



hardening said one of said plurality of flutes by causing a relative movement between said roll and said focused beam in a direction parallel to the length of said roll.

5,180,449

GALVANIZED HIGH-STRENGTH STEEL SHEET HAVING LOW YIELD RATIO AND METHOD OF PRODUCING THE SAME

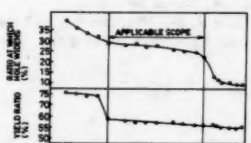
Susumu Masui; Kei Sakata, and Fusao Togashi, all of Chiba, Japan, assignors to Kawasaki Steel Corp., Hyogo, Japan

Filed Jan. 16, 1992, Ser. No. 822,163

Claims priority, application Japan, Jan. 21, 1991, 3-44580

Int. Cl.[5] C23C *2/00, 2/06*

U.S. Cl. 148—533 **4 Claims**



1. A method of producing a galvanized high-strength steel sheet having a tensile strength of not less than 80 kgf/mm^2 and a yield ratio of not more than 60%, the method comprising the steps of: preparing a steel slab having a composition of 0.08 to 0.20 wt % of C, 1.5 to 3.5 of wt % of Mn, 0.010 to 0.1 wt % of Al, 0.010 wt % or less of P, 0.001 wt % or less of S, one or both of 0.010 to 0.1 wt % of Ti and 0.010 to 0.1 wt % of Nb, and the balance substantially Fe and incidental impurities; hot-rolling said steel slab; cold-rolling said steel slab; forming said steel slab into a steel strip having a final thickness; heating said steel strip in a temperature range from (Ar_3−30° C.) to (Ar_3−70° C.); recrystallization-annealing said steel strip; cooling said steel strip at a cooling rate of not less than 5° C./s to a temperature range from 450° C. to 550° C.; galvanizing said steel strip while maintaining it in said temperature range for 1 minute to 5 minutes or less; and cooling said galvanized steel strip at a cooling rate of 2° C./s to 50° C./s.

5,180,450

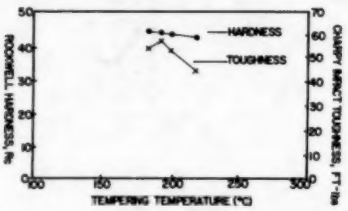
HIGH PERFORMANCE HIGH STRENGTH LOW ALLOY WROUGHT STEEL

Banagaru V. N. Rao, Annandale, N.J., assignor to Ferrous Wheel Group Inc., New York, N.Y.

Filed Jun. 5, 1990, Ser. No. 533,574

Int. Cl.[5] C22C *38/00*

U.S. Cl. 148—579 **16 Claims**



1. A fine grained, high strength, tough, low alloy, low to medium carbon wrought steel having an ultimate tensile strength of about at least 200 ksi, said steel having a microstructure in which soft and tough austenite films surround lath martensite, and consisting essentially by weight of about 0.5 to 4% Cr, about 0.05 to 0.5% C, about 0.5 to 2% Mn, about 0.1 to 2% Cu, about 0.1 to 3% Ni, about 0.01 to 0.05% Al, about 0.005 to 0.02% Ti, about 0.005 to 0.03% Nb and the balance essentially iron including minor amounts of tramp elements P, S, Si, and N, the amount of Si not exceeding about 0.1%, said steel being characterized by an average grain size of less than about 50 microns.

5,180,451

PROCESS FOR THE PRODUCTION OF LONGITUDINALLY-DIRECTED COARSE-GRAINED COLUMNAR CRYSTALS IN A WORKPIECE CONSISTING OF AN OXIDE-DISPERSION-HARDENED NICKEL-BASED SUPERALLOY

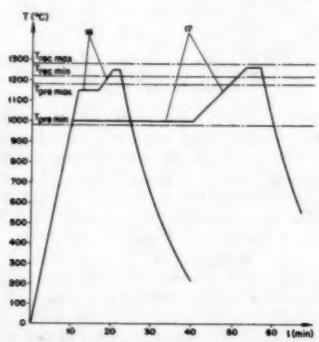
Mohamed Y. Nazmy, Fislisbach, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Mar. 19, 1991, Ser. No. 672,168

Claims priority, application Switzerland, Mar. 20, 1990, 920/90

Int. Cl.[5] C22F *1/10*

U.S. Cl. 148—675 **7 Claims**



1. A process for the production of longitudinally oriented coarse-grained columnar crystals in a workpiece consisting of an oxide-dispersion-hardened nickel-based superalloy having a Cr content of 15.5 to 25% by weight of Cr, wherein the workpiece is subjected to the following heat treatment:

providing the workpiece in a warm-worked fine-grained condition;

heating the workpiece at a heating rate to a preheating temperature T_{pre}, which is at least 5° C. below the minimum recrystallization temperature necessary for the material, $T_{rec\ min}$, and is at least at the minimum solution annealing temperature for carbides in the γ-matrix;

maintaining the workpiece at the preheating temperature T_{pre} for the purpose of isothermal annealing for at least 5 min;

immediately heating the workpiece at a heating rate of between 10° C./min and 40° C./min to the recrystallization temperature T_{rec} without prior cooling; and

cooling the workpiece to room temperature at a cooling rate of between 5° C./min and 200° C./min.

5,180,452

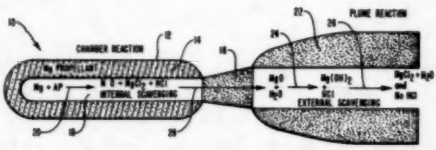
SOLID PROPELLANT FORMUALTIONS PRODUCING ACID NEUTRALIZING EXHAUST

Gary K. Lund, Ogden; Mark J. Spinti, Salt Lake City, and Daniel W. Doll, North Ogden, all of Utah, assignors to Thiokol Corporation, Ogden, Utah

Filed Dec. 27, 1990, Ser. No. 634,391

Int. Cl.[5] C06B *45/10*

U.S. Cl. 149—19.9 **18 Claims**



1. A composite solid rocket propellant formulation comprising:

from about 60% to about 70% ammonium perchlorate;

from about 19% to about 27% free metal, said metal acting both as a fuel within the propellant formulation and as a chloride ion scavenger, such that upon burning the propellant, substantially all of the chloride ion produced reacts with said free metal, said free metal being selected from the group consisting of lithium, calcium, strontium, and magnesium, said free metal having a particle size of from about 90 microns to about 1 millimeter;

between about 0% and 3% free metal other than said free metal fuel and chloride ion scavenger;

from about 0.0001% to about 1.0% burn rate catalyst;

from about 5% to about 21% halogen-free binder.

5,180,453

HEAVY DUTY PNEUMATIC TIRES

Fumiaki Fukasawa, and Hiromichi Ikeda, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Mar. 20, 1990, Ser. No. 497,033

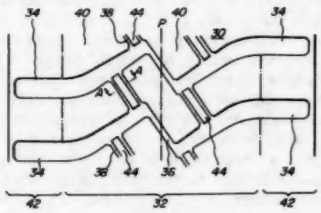
Claims priority, application Japan, Mar. 24, 1989, 1-70422; Nov. 21, 1989, 1-300662

Int. Cl.[5] B60C *11/08*

U.S. Cl. 152—209 R **9 Claims**

1. A heavy duty pneumatic tire comprising; lug grooves formed in each half region of a tread portion and separated from each other at a given interval in a circumferential direction of the tire, island portions defined by said lug grooves, an auxiliary groove connecting at least two lug grooves located in said half region of the tread portion and separated from each other in the circumferential direction of the tire to each other, said auxiliary grooves formed in a central region of the tread portion within a range of about 50% of a tread width, a step protrusion extending along the auxiliary groove and arranged at least inside the auxiliary groove, and a grove width W_1 of the auxiliary groove, a groove depth d_1 of the auxiliary groove

from tread surface, a width W_2 of a surface of the step protrusion and a height d_2 from the bottom of the auxiliary groove to the surface of the step protrusion satisfy relationship of



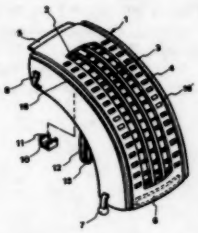
$(W_1-W_2)/2W_1<0.2$ and $0.70<d_2/d_1<0.95$, and said step protrusion has a length of not less than 30 mm and a width W_2 of not less than 10 mm.

5,180,454

ANTI-SKID TIRE APPARATUS

Jung-Yoon Seo, 383-9 Pukkajwa-1-dong, Seodaemun-ku, Seoul, Rep. of Korea

Filed Sep. 19, 1990, Ser. No. 584,658
Int. Cl.[5] B60C *27/20*
U.S. Cl. 152—229 **5 Claims**



1. An anti-skid tire apparatus to be installed on a tire comprising:

a cover structure having a plurality of sections, each of said sections having an outer tread surface, said each section having an internal sidewall and an external sidewall having a plurality of fastening slots, each said outer tread surface having a plurality of grooves, said grooves having a first plurality of apertures;

a plurality of cleats having a plurality of jagged edges, said cleats being permanently affixed in said first plurality of apertures at fixed intervals along said outer tread surface of said sections;

a plurality of straps affixed onto said plurality of fastening slots;

a belt passing through said plurality of straps, said belt having a belt buckle to fasten ends of said belt; and

means on the internal sidewall for fastening said sections of said cover structure together said fastening means including a connecting hook and an eyelet.

5,180,455

PNEUMATIC TIRE AND IMPROVED INFLATION AND DEFLATION VALVE DEVICE

Ying-Hsung Cheng, Av. Hipolito Yrigoyen 12904 Adrogue Provincia, Buenos Aires, Argentina

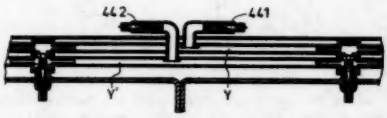
Filed Aug. 7, 1991, Ser. No. 741,555
Int. Cl.[5] B60C *5/24*
U.S. Cl. 152—338.1 **7 Claims**

1. A pneumatic tire, comprising:

an inflatable cell unit having a cell inlet opening;

a check valve means provided in said cell inlet opening and including a tubular valve stem having a first portion extending into said inflatable cell unit and a second portion extending outwardly from said cell inlet opening, a hollow valve body provided inside said valve stem and having an open-ended wide portion communicated with said second portion of said valve stem and an open-ended tapered portion defining a valve seat and extending into said first portion of said valve stem, a shaft extending axially through said valve body and said valve stem, a piston provided on an intermediate portion of said shaft in said first portion of said valve stem, and a biasing means to urge said piston to seal said valve seat;

a control chamber disposed adjacent to said cell inlet opening of said inflatable cell unit and including a diaphragm means provided therein so as to partition said control chamber into a first fluid compartment disposed adjacent



to said inflatable cell unit and a second fluid compartment, said second portion of said tubular valve stem extending into and being communicated with said first fluid compartment, said shaft having one end extending into said first fluid compartment and being secured to said diaphragm means so as to permit axial movement of said shaft with said diaphragm means to correspondingly move said piston toward and away from said valve seat;

a first tire valve means to charge air into and to release air from said second fluid compartment so as to move said diaphragm means and axially move said shaft to correspondingly move said piston toward and away from said valve seat; and

a second tire valve means to charge air into and to release air from said first fluid compartment so as to inflate or deflate said inflatable cell unit when said piston is displaced from said valve seat.

5,180,456

ADAPTIVE INFLATION CONTROL FOR VEHICLE CENTRAL TIRE INFLATION SYSTEM

Gary R. Schultz, Kalamazoo, and Lawrence M. Ruzicka, Portage, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 15, 1991, Ser. No. 792,552
Int. Cl.[5] B60C *23/00*
U.S. Cl. 152—416 **4 Claims**

1. A vehicle including a plurality of inflatable tire volumes and an onboard tire pressure control system comprising:

an air source providing pressurized air for inflating the tires;

valve means movable from a closed position blocking air communication between the air source and the volumes to an open position allowing such communication in response to a valve open signal;

selector means producing any of several demand tire pressure signals representative of desired tire pressure;

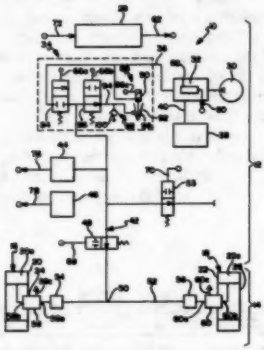
a control circuit including means operative to produce an inflation signal in response to means producing a signal indicating current tire pressure being less than demand tire pressure, the improvement comprising;

means operative in response to the inflation signal to initiate transmittal of a series of the valve open signals with a time space between each valve open signal and with each valve open signal having a time period;

means for terminating the series in response to means sensing

the current tire pressure not being less than the demand tire pressure;

means for producing a count of the number of valve open signals in the series; and



means for increasing the time period in a next series in response to the count being greater than a predetermined count range and for decreasing the time period of the next series in response to the count being less than the predetermined count range.

5,180,457

PNEUMATIC RADIAL TIRES FOR CONSTRUCTION VEHICLES

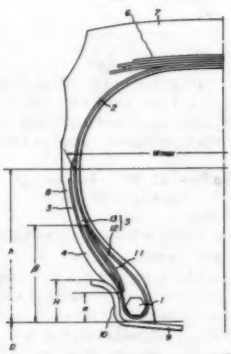
Yoichi Honbo; Satoshi Yoshizaki, both of Kodaira, and Motohiro Iwasaki, Higashiyamato, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 26, 1991, Ser. No. 660,819

Claims priority, application Japan, Mar. 1, 1990, 2-47298

Int. Cl.[5] B60C *15/06*

U.S. Cl. 152—541 **7 Claims**



1. A pneumatic radial tire for construction vehicles comprising; a radial carcass of rubberized steel cord ply toroidally extending between a pair of bead cores and wound around the bead core from inside of the tire toward outside to form a turnup portion, a stiffener rubber disposed on the bead core, and at least two reinforcing layers of rubberized fiber cord fabrics having different cord directions and embedded in the stiffener rubber as a bead portion reinforcement so that said reinforcing layers do not extend along an outer surface of the carcass ply and the surface of said turnup portions; said reinforcing layer satisfying the following relations:

$$\alpha=(0.5-0.87).H$$

$$\beta=(0.52-0.78).h$$

where: α is a height of an end of the reinforcing layer positioned in the vicinity of the inner surface of the turnup portion and inward in the radial direction of the tire and measured from base line of a normal rim, β is a height of other end of the reinforcing layer positioned in the vicinity of the outer surface of the carcass ply and outward in the radial direction of the carcass ply and outward in the radial direction of the tire and measured from the base line, H is a flange height of the normal rim and h is a height at a position corresponding to maximum width of the carcass measured from the base line, wherein said stiffener rubber is comprised of a hard rubber layer extending closely along the outer surface of the carcass ply above the bead core and outward in the radial direction of the tire to gradually reduce the thickness thereof, and a soft rubber layer extending closely along the inner surface of the turnup portion and the outer surface of the carcass ply outward in the radial direction of the tire, and the reinforcing layer is arranged at the boundary between the hard rubber layer and the soft rubber layer.

5,180,458

METHOD OF LINING OF METALLIC PIPE USING A PLURALITY OF CONCENTRIC FLEXIBLE TUBES OF THERMOPLASTIC POLYMER

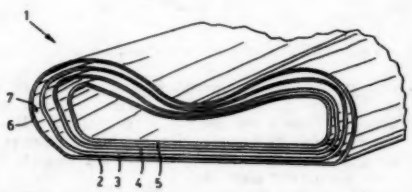
George White, Glenburnie, Canada, assignor to Du Pont Canada, Inc., Mississauga, Canada

Filed Apr. 26, 1991, Ser. No. 692,159

Claims priority, application United Kingdom, May 2, 1990, 9009899

Int. Cl.[5] B29C *63/34*

U.S. Cl. 156—87 **6 Claims**



1. A method of lining of metallic pipe consisting essentially of:

(a) forming a plurality of at least five concentric flexible tubes from film of thermoplastic polymer, said thermoplastic polymer being selected from the group consisting of polyethylene and polyamide, said tubes having a coating of grafted polyolefin on at least one surface thereof such that in the plurality of concentric tubes at least one tube surface in face-to-face relationship with another tube surface has said coating thereon;

(b) simultaneously inserting each flexible tube into a section of metallic pipe by pulling said plurality of tubes into the pipe;

(c) inflating the tubes using a fluid under pressure; and

(d) heating the tubes within the pipe to cause the tubes to be bonded together to form a single tube lining said metallic pipe; each tube of the plurality of tubes having a thickness in the range of about from 40 to 800 microns, and the thickness and number of tubes being selected to provide said single tube with a total thickness of about from 0.1 to 2.5 cm.

5,180,459

PROCESS FOR PRODUCING SEALING COMPONENTS FROM ALL-CARBON COMPOSITE MATERIAL

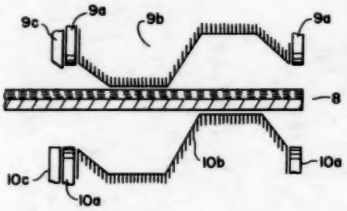
Jean-Michel Bauer, and Maurice Bontems, both of Pagny S/Moselle, France, assignors to Le Carbone Lorraine, Courbevoie, France

Filed Jul. 25, 1991, Ser. No. 735,892

Claims priority, application France, Jul. 26, 1990, 90-09803

Int. Cl.[5] B32B *31/18, 31/20;* **C01B** *31/02*

U.S. Cl. 156—89 **8 Claims**



1. Process for producing carbon composite components (1) of a large area in relation to the thickness and having an edge (2) and a central part (3), comprising at least one layer of carbon/carbon composite (4) and at least one layer of recompressed expanded graphite (5), said process comprising the steps of: (a) establishing a stack (8) of at least one layer of preimpregnate (6) based on a carbon-files lap impregnated with carbonisable resin and of at least one layer of expanded graphite (7); (b) compressing the stack; and (c) curing the compressed stack by a thermal treatment at high temperature to obtain a sealing carbon composite component (1) with a central part (3) having a high deformation level and/or with an edge (2) providing self-bonding of the layers of the components, wherein in step (a) the stack (8) is prepared of at least one layer of preimpregnate (6) comprising a sheet, optionally deformable, based on carbon files or a precursor of carbon fibres, of an area at least equal to that of the central part, and of at least one layer of expanded graphite (7a) of a specific gravity of between 0.03 and 0.06 and of an area at least equal to an area of a projection of the said component on the mid-plane (11), and wherein in step (b) the stack (8) is compressed between a punch (9) and a die (10) of a press under a pressure of between 2.5 and 15 MPa and at a temperature of between 50° and 200° C., in such a way that the thickness of the edge (2) is at least equal to that of the central part (3) and the specific gravity of the expanded graphite is between 0.3 and 0.6 for the edge and between 1 and 1.5 for the central part, and wherein in step (c) the compressed component is treated thermally at a temperature of between 400° and 3000° C.

5,180,460

INVERTING SEAT COVERS

Gerald A. Coon, Cridersville; Douglas A. Reinhart, Tiffin, and Lawrence D. Ray, North Baltimore, all of Ohio, assignors to Findlay Industries, Findlay, Ohio

Filed Nov. 12, 1991, Ser. No. 791,020

Int. Cl.[5] B68G *7/05*

U.S. Cl. 156—93 **8 Claims**

1. A method of making a seat cover, said set cover having front and back panels, said panels including wear surfaces, comprising,

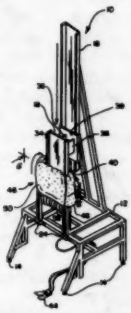
securing padding to the front panel of a seat cover,

securing the front panel to said back panel to form a pocket secured together along three sides to provide a closed end, closed sides and an open end with the secured sides at the periphery of said pocket and with the wear surfaces of said seat cover forming the inside of said pocket, said padding filling a large percentage of the volume of the pocket and thereby making inversion of said pocket physically difficult,

providing a pair of generally parallel arms, one end of each said arm being secured to a support, each arm including rollers at each end and an endless belt passing over said rollers,

mounting said pocket over said arms with its closed end remote from said secured ends of said arms, locating said belts such that said belts are the only portions of said arms in physical contact with said wear surfaces,

providing a plate with a blunt edge,



pushing said blunt edge against said closed pocket end and between and longitudinally along said arms,

supporting the interior surfaces of said pocket on said endless belt and preventing contact between said arms and said seat cover as the plate moves between said arms and inverts said pocket to a right-side-out position enveloping said plate,

moving said plate from between said arms, and

stripping said seat cover from said plate.

5,180,461

APPARATUS TO APPLY REINFORCEMENTS ON FILING GUIDES OR INSERTS, AND METHOD

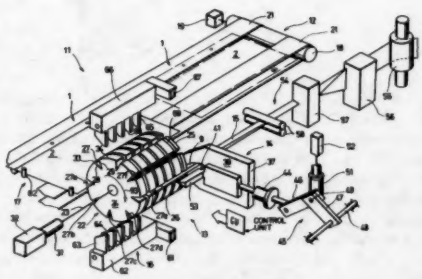
Werner Widmann, Plochingen, Fed. Rep. of Germany, assignor to Karl Widmann Schweissmaschinen GmbH, Schlierbach, Fed. Rep. of Germany

Filed Aug. 1, 1990, Ser. No. 561,453

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1989, 3934217

Int. Cl.[5] B26D *5/00*

U.S. Cl. 156—216 **52 Claims**



1. Apparatus to apply reinforcement elements (9) on index tabs (7) of file guides (1) having

a transport means (12) for moving file guide stock material (2) along a predetermined transport path;

a reinforcing ribbon (15) and a supply means (54) for supply-

ing the reinforcing ribbon about an edge of the file guide stock material (2);

means (13) for joining a portion of the reinforcing ribbon (15) about an edge of the file guide stock (2), said joining means being located along said predetermined transport path,

comprising, in accordance with the invention,

gripper means (22) rotatable about an axis (23), said gripper means including

a rotatable base body formed with at least one axially extending groove (27) in the circumference of the base body, said at least one groove defining two opposite edge portions (33, 34) adjacent the circumference of the base body and extending parallel to said axis (23);

controlled moving means (32) coupled to said gripper means (22) for moving the gripper means between

a receiving position in which said at least one groove (27) of the gripper means (22) is operatively associated with the reinforcing ribbon (15) to receive the reinforcing ribbon in said groove, and

a delivery position in which said at least one groove (27) of the gripper means (22) is in the transport path of the stock material (2); and

an application means (16) for applying the ribbon in the groove (27) of the gripper means (22) on and over the edge of the file guide stock material (2).

5,180,462

PAIR OF HOOKS FOR AN APPARATUS FOR THE MANUFACTURE OF A TIRE REINFORCEMENT AND APPARATUS COMPRISING SUCH PAIR OF HOOKS

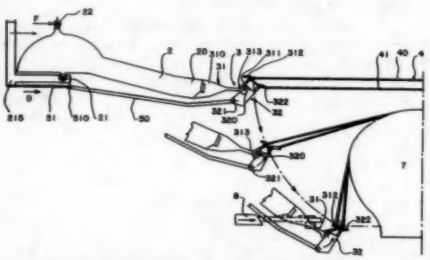
Olivier Dailliez, Chamalieres, and Jean-Claude Mayet, Clermont-Ferrand, both of France, assignors to Sedepro, Paris, France

Filed Dec. 20, 1990, Ser. No. 630,522

Claims priority, application France, Dec. 28, 1989, 89 17521

Int. Cl.[5] B29D *30/10*

U.S. Cl. 156—397 **5 Claims**



1. Apparatus for the manufacture of a reinforcement for tires, said reinforcement being formed from a single cord, said apparatus having two coaxial rings of levers, each lever having a pair of hooks at its end located closest to the adjacent ring of levers to retain the cord and means for the presentation of the cord to the hooks, the levers being displaceable between a hooking position for hooking of the cord to said pairs of hooks and an unhooking position, characterized by the fact that a first hook of said pair is mounted fixed on the lever and a second hook of said pair is located radially inside the first hook when the levers are in the hooking position and mounted for movement wit respect to the first hook and including a control member for imparting a positive controlled movement to the second hook relative to the first hook with displacement of the lever to the unhooking position.

5,180,463

METHOD FOR FORMING COATED MONOCRYSTALLINE PRODUCTS

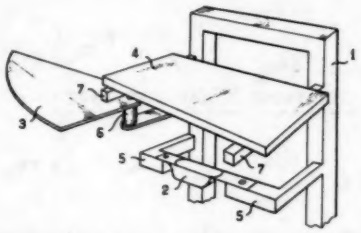
Jacques Le Moigne; Annette Thierry, both of Strasbourg, and Pierre Guerder, Pithiviers, all of France, assignors to Quartz et Silice, Courbevoie, France

Filed Dec. 21, 1989, Ser. No. 454,343

Claims priority, application France, Dec. 26, 1988, 88 17178

Int. Cl.[5] C30B *19/00*

U.S. Cl. 156—603 **14 Claims**



1. A process for forming a coated monocrystalline product which comprises:

(a) cleaving an organic monocrystal comprising an orthophthalate material to produce a face thereupon which is substantially free from environmental degradation;

(b) depositing a coating of a diacetylene monomer upon at least a portion of said face; and

(c) polymerizing said monomer upon said face so as to form a monoriented polydiacetylene layer thereupon.

5,180,464

DRY ETCHING METHOD

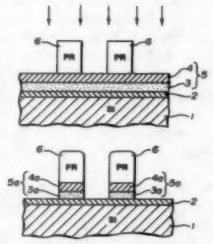
Tetsuya Tatsumi, and Shingo Kadomura, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 22, 1991, Ser. No. 644,014

Claims priority, application Japan, Jan. 22, 1990, 2-10489; Feb. 27, 1990, 2-47074

Int. Cl.[5] H01L *21/306;* B44C *1/22*

U.S. Cl. 156—626 **5 Claims**



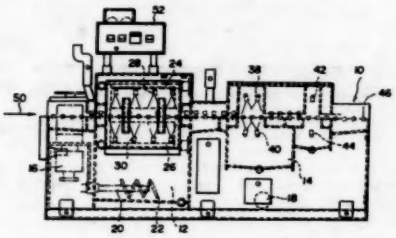
1. A method for dry etching of a polycide film consisting of a refractory metal silicide layer and a polysilicon layer, wherein the improvement resides in that said polycide film is etched with the use of an etching gas containing a fluorine base gas mixed with at least HBr.

5,180,465

ETCHING METHOD OF FORMING MICROCIRCUIT PATTERNS ON A PRINTED CIRCUIT BOARD

Kameharu Seki; Shin Kawakami, and Isamu Kubo, all of Saitama, Japan, assignors to Nippon CMK Corp., Japan

Filed Jul. 22, 1991, Ser. No. 734,203
Int. Cl.[5] B44C 1/22; C23F 1/00
U.S. Cl. 156—640 6 Claims



1. An etching method of forming circuit patterns on a printed circuit board, comprising:

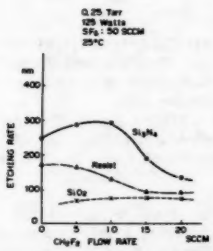
supplying etching solvent from a solvent pump at a discharge pressure of substantially 5–10 kg/cm^2 and a discharge particle diameter of 100–200 μm.

5,180,466

PROCESS FOR DRY ETCHING A SILICON NITRIDE LAYER

Teshiki Shin, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 287,564, Dec. 19, 1988, abandoned, which is a continuation of Ser. No. 143,302, Jan. 11, 1988, abandoned, which is a continuation of Ser. No. 813,896, Dec. 27, 1985, abandoned. This application Apr. 4, 1991, Ser. No. 681,473
Claims priority, application Japan, Dec. 29, 1984, 59-280138
Int. Cl.[5] H01C 21/00
U.S. Cl. 156—643 10 Claims



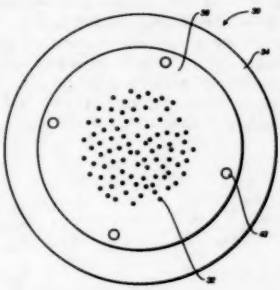
1. A process for substantially selective dry etching of unmasked Si_3N_4 in preference to SiO_2 and a photoresist mask, wherein unmasked Si_3N_4, in the presence of SiO_2 and said photoresist mask are dry etched in a gas comprising SF_6 and CH_2F_2, mixed in a ratio between 100:8 and 100:24 at a pressure of 0.10 Torr or higher.

5,180,467

ETCHING SYSTEM HAVING SIMPLIFIED DIFFUSER ELEMENT REMOVAL

Roger D. Cook, Manteca, and Daniel V. Milina, Los Gatos, both of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 564,801, Aug. 8, 1990, abandoned. This application Aug. 10, 1990, Ser. No. 565,621
Int. Cl.[5] B44C 1/22
U.S. Cl. 156—643 12 Claims



9. Method for disassembling a semiconductor wafer etching system having an upper electrode assembly for providing a source of gas into a plasma zone near a ground grid assembly via a diffuser plate comprising the steps of:

removing a clamping ring assembly which forms a sealed plasma zone;

removing a ground grid assembly which forms a ground electrode between said clamping ring assembly and said upper electrode assembly; and,

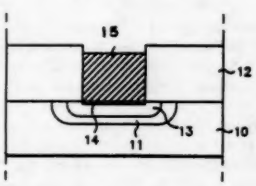
removing a diffusing element of the diffuser plate from said semiconductor wafer etching system while leaving said upper electrode assembly mounted to said semiconductor wafer etching system.

5,180,468

METHOD FOR GROWING A HIGH-MELTING-POINT METAL FILM

Kwang-Ok Ko, Seoul, and Jong-Ho Park, Kyounggi, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Filed Aug. 31, 1990, Ser. No. 575,627
Claims priority, application Rep. of Korea, Jul. 5, 1990, 1990-10173
Int. Cl.[5] C23C 14/00, 16/00
U.S. Cl. 156—644 13 Claims



7. A method for growing a high-melting-point metal film comprising the steps of:

forming a first ion-implanted layer in a given region of a silicon substrate, over which an insulating layer is deposited;

selectively etching said insulating layer to form a contacting aperture through which a portion of said first ion-implanted layer is exposed;

forming on a surface of said first ion-implanted layer a sec-

ond ion-implanted layer having surface imperfection by ion-implantation of a given impurity through said contacting aperture;

contacting tungsten fluoride gas with said second ion-implanted layer through said contacting aperture to grow a film of tungsten and reduce the silicon on the surface of said section ion-implanted layer;

pyrolyzing the tungsten fluoride gas and a silane gas, having the ration of three to two, respectively, through said contacting aperture for 45–90 seconds at a temperature between 280° and 300° C., so as to grow a tungsten film having the thickness of 1,500–3,000Å; and

subjecting said silicon substrate to a heat treatment for two minutes at the temperature of about 450° C.;

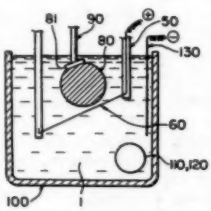
whereby said step of pyrolyzing the tungsten fluoride and silane gases and said step of subjecting said silicon substrate to a heat treatment are alternatively repeated.

5,180,469

METHOD FOR SLICING A SEMICONDUCTOR SILICON SINGLE CRYSTAL

Yasuhiko Abe, Tokyo, Japan, assignor to Kyoto Handotai Co., Ltd., Kyoto, Japan

Filed Sep. 9, 1991, Ser. No. 756,574
Claims priority, application Japan, Sep. 19, 1990, 2-247377
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—653 **8 Claims**



1. A method for slicing a single crystal of semiconductor silicon into wafers which comprises the step of:

(a) holding the single crystal of semiconductor silicon as immersed in an acidic aqueous solution containing sulfuric acid and hydrofluoric acid;

(b) holding a metal wire having a surface of platinum under a tension in the said acidic aqueous solution at a small distance from the surface of the single crystal;

(c) immersing a metal electrode in the said acidic aqueous solution;

(d) electrolyzing the acidic aqueous solution with the wire and the metal electrode as the anode and the cathode, respectively, the current density on the surface of the anode being at least 50 A/dm^2, to produce an ozone-containing oxidizing gas which oxidizes the silicon into silicon dioxide;

(e) removing the silicon dioxide by dissolving in the acidic aqueous solution to form a groove in the single crystal; and

(f) moving the wire or the single crystal in such a manner that a small distance is kept between the wire and the single crystal at the bottom of the groove until the single crystal is cut through.

5,180,470

DEPOSITION OF HIGHLY-ORIENTED PTFE FILMS AND USES THEREFOR

Paul Smith, Santa Barbara, Calif., and Jean C. Wittmann, Mundolsheim, France, assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 5, 1989, Ser. No. 361,129
Int. Cl.[5] C30B *29/58*
U.S. Cl. 156—600 **23 Claims**

1. A process for controlling the growth of crystal-forming or liquid crystalline material to provide ordered crystalline films comprising the steps of:

forming a highly-oriented poly(tetrafluoroethylene) substrate in which the poly(tetrafluoroethylene) macromolecules are oriented substantially parallel to one another;

contacting said oriented poly(tetrafluoroethylene) substrate with a crystal-forming or liquid crystalline material;

solidifying said crystal-forming or liquid crystalline material to yield an oriented crystalline solid on said poly(tetrafluoroethylene) substrate in which one of the crystallographic axes of said crystalline solid is oriented substantially parallel to the poly(tetrafluoroethylene) macromolecules.

5,180,471

NON-NESTING MULTI-PLY TISSUE AND METHOD FOR MAKING SAME

Robert D. Sauer, Freedom, and Mustafa M. Jamal, Menasha, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 9, 1991, Ser. No. 638,935
Int. Cl.[5] D21H *27/40*
U.S. Cl. 162—112 **30 Claims**

1. In a method for making a multi-ply tissue in which an aqueous slurry of papermaking fibers is continuously deposited onto a traveling foraminous fabric, dewatered, and dried to form a first tissue web, said first tissue web being combined with one or more other tissue webs to form a multi-ply tissue, the improvement comprising brushing at least one surface of the first tissue web to increase the extent to which fibers protrude from the brushed surface of the first tissue web and combining the first tissue web with the other one or more tissue webs to form a multi-ply tissue such that the brushed surface of the first tissue web is facing inwardly.

5,180,472

METHOD FOR THE MANUFACTURE OF ANTI-STATIC SHEETS FOR USE IN HIGH PRESSURE LAMINATES

Frank L. Cessna, Middletown, Ohio, assignor to The Sorg Paper Company, Middletown, Ohio

Division of Ser. No. 333,093, Apr. 4, 1989, Pat. No. 5,089,327, which is a continuation-in-part of Ser. No. 50,076, May 15, 1987, abandoned. This application Aug. 22, 1991, Ser. No. 748,626
Int. Cl.[5] D21H *27/18*
U.S. Cl. 162—138 **6 Claims**

1. A method of manufacturing an anti-static laminating sheet which comprises providing a furnish composed of:

47%–53% Pontiac hardwood

37%–39% high alpha hardwood

8%–16% cotton linters

forming said furnish into a sheet and saturating said sheet with a water solution of a water soluble polycationic quaternary ammonium polymer which is free from metallic salts, said solution being mixed in a portion of about 1.5 gallons of poly-

mer to about 4.5 gallons of water, said polymer solution being applied to said sheet at a temperature of from 135° F. to 155° F., including the step of adding a wet strength resin to said sheet as an incident of its formation in a quantity sufficient to maintain the integrity of the sheet during saturation with said polymer solution.

5,180,473

PAPER-MAKING PROCESS

Kenichi Akune; Naotaka Watanabe; Yukihiro Inomiya, all of Tokyo; Hiroshi Itoda, Kanagawa; Takeo Arai, Kanagawa, and Reiko Funato, Kanagawa, all of Japan, assignors to Mitsui-Cyanamid, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 411,092, Sep. 22, 1989, abandoned. This application May 15, 1991, Ser. No. 701,636

Int. Cl.[5] D21H *17/45*

U.S. Cl. 162—168.2 **6 Claims**

1. A paper-making process for preparing a paper from paper stock suspension, which comprises adding to said suspension either water-swellable cationic polymer particles or water-swellable cationic polymer particles together with acrylamide-based polymer, wherein the water-swellable cationic polymer is a copolymer composed of either a cationic vinyl monomer selected from the group consisting of quaternary nitrogen-containing (meth)acrylates, salts of tertiary nitrogen-containing (meth)acrylates with acids, quaternary nitrogen-containing (meth)acrylamides, salts of tertiary nitrogen-containing (meth-)acrylamides with acids and diethyldialkyl ammonium chloride, and a crosslinkable monomer selected from the group consisting of methylene bisacrylamide, methylene bismethacrylamide, divinyl benzene, acrolein and methacrylamideglycolate methyl ether, or a copolymer composed of said cationic vinyl monomer, a non-ionic water-soluble monomer copolymerizable with the said vinyl monomer, selected from the group consisting of acrylamide, methacrylamide, vinyl methyl ether, vinyl ethyl ether, N-vinyl pyrrolidone; N,N-dialkyl(meth)acrylamide, and N-vinylmethacetamide and said crosslinkable monomer and said crosslinkable monomer is present at 100 to 10,000 ppm based on the total weight of the monomers and forming paper from said stock suspension.

5,180,474

METHOD OF SEPARATION OF AROMATES BY EXTRACTIVE DISTILLATION

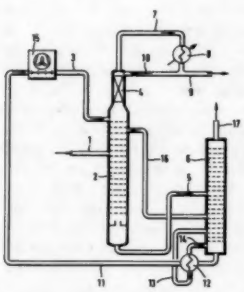
Luzian Skatulla, Mühlheim an der Ruhr; Hans-Jürgen Vollmer, Essen, and Hans-Christoph Schneider, Hattingen, all of Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Jan. 27, 1992, Ser. No. 825,946

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1991, 4109632

Int. Cl.[5] B01D *3/40;* **C07C** *7/08*

U.S. Cl. 203—84 **4 Claims**



1. A method of separation of aromates from hydrocarbon mixture by extractive distillation with a selective solvent, comprising introducing a hydrocarbon mixture into the extractive distillation column, distillating out non-aromate components of the introduced hydrocarbon mixture from a head of the extractive distillation column; withdrawing aromates together with a used solvent from a sump of the extractive distillation column and supplying to a driving out column; separating the aromates from the solvent in the driving-out column; withdrawing the aromates as a head product and the solvent as a sump product from the driving-out column; reintroducing the withdrawn solvent into the extractive distillation column, said withdrawing of the solvent from the driving-out column including withdrawing only a part of the solvent as a solvent partial stream with a higher temperature and a lower aromate content from the sump of the driving out column, while a remaining portion of the solvent with a higher aromate content and a lower temperature is withdrawn as a side stream from the driving-out column; reintroducing the side stream into the extractive distillation column at a location which is 6–10 plate below an inlet from the solvent stream coming from the sump of the driving-out column, and separating residual solvent from the recovered non-aromates in an additional column located above the extractive distillation column.

5,180,475

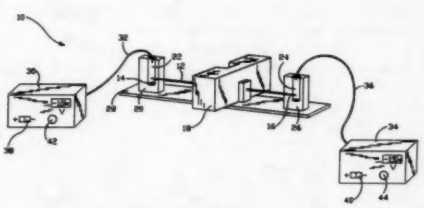
SYSTEM AND METHOD FOR CONTROLLING ELECTROOSMOTIC FLOW

James E. Young, La Honda; Douglass McManigill, and Jurgen A. Lux, both of Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 4, 1991, Ser. No. 754,797

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—180.1 **15 Claims**



1. A method of controlling the rate of electroosmotic flow of a sample solution comprising,

providing an electrophoresis apparatus having a flow region,

inducing an electroosmotic flow of a solution within said flow region,

electrophoretically separating constituents of said solution, including applying a first voltage level to a first end of said flow region and applying a second voltage level to a second end of said flow region,

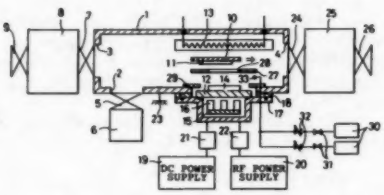
changing the rate of electroosmotic flow along said flow region during said step of electrophoretically separating constituents by adjusting the voltage levels at each of said first and second ends relative to ground, thereby providing a third voltage level to said first end and providing a fourth voltage level to said second end, the potential difference between said first and second voltage levels being substantially equal to the potential difference between said third and fourth voltage levels, and

continuing said step of electrophoretically separating said constituents at said changed rate of electroosmotic flow.

5,180,476
METHOD FOR PRODUCING TRANSPARENT CONDUCTIVE FILMS

Satoru Ishibashi, Chiba; Kyuzo Nakamura; Yasushi Higuchi, both of Yachimatamachi; Takashi Komatsu, Narita; Yuzo Murata, Narutoumachi, and Yoshifumi Ota, Yachimatamachi, all of Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasaki, Japan

Filed Feb. 26, 1991, Ser. No. 660,840
Claims priority, application Japan, Feb. 27, 1990, 2-44558
Int. Cl.[5] C23C *14/35*
U.S. Cl. 204—192.29 **3 Claims**



1. A method of producing an In-O, Sn-O, Zn-O, Cd-Sn-O or Cd-In-O based transparent conductive film with an optional additional of a donor element, said method comprising the steps of:

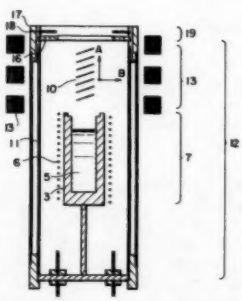
maintaining an intensity of a magnetic field on a surface of a target at a level of at least 600 Oe; and

sputtering the target so as to form the transparent conductive film on a substrate by charging the target, simultaneously with said maintaining of the magnetic filed intensity, with a DC electric field superimposed with an RF electric field so as to lower the sputtering voltage to 250 volts or less.

5,180,477
THIN FILM DEPOSITION APPARATUS

Hiroki Ito, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1991, Ser. No. 718,367
Claims priority, application Japan, Jun. 25, 1990, 2-164184
Int. Cl.[5] C23C *14/00*
U.S. Cl. 204—298.05 **5 Claims**



1. A thin film deposition apparatus comprising:

a vacuum chamber in which a predetermined vacuum is maintained;

a means for mounting a substrate placed inside the vacuum chamber;

a crucible placed in such a manner as to oppose the substrate inside the vacuum chamber for housing a deposition material whose metallic ions impinge the substrate;

a heater disposed around the crucible for heating the crucible;

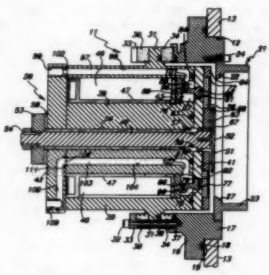
a cathode filament placed in the vicinity of the opening of the crucible; and

an anode disposed in such a manner as to surround the crucible, the heater and the cathode, wherein said anode is adapted to be maintained at a temperature higher than the melting point of said deposition material.

5,180,478
SPUTTER COATING SOURCE

John L. Hughes, Rodeo, Calif., assignor to Intevac, Inc., Santa Clara, Calif.

Filed Dec. 19, 1990, Ser. No. 633,586
Int. Cl.[5] C23C *14/35*
U.S. Cl. 204—298.09 **7 Claims**

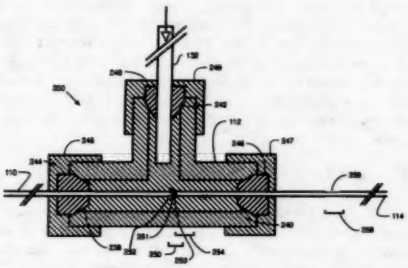


1. In a magnetically enhanced sputter coating source adapted to sputter deposit magnetic materials: a cathode pole structure having a front side and a back side and comprising ferromagnetic material capable of supporting a magnetic field, an anode insulated electrically from said cathode pole structure, means for applying an electrical potential between the anode and said cathode pole structure, means adapted to support and removably mount a target of magnetic material on the front side of said cathode pole structure, magnetic means positioned at the rear side of said cathode pole structure, means for creating a magnetic field extending outwardly from said magnetic means and through said cathode pole structure and through a magnetic target mounted on said cathode pole structure and into a region in front of the target, means defining a cooling passageway on the back side of said cathode pole structure and between said cathode pole structure and said magnetic means, an annular recessed area in the back side of said cathode pole structure which reduces the cathode pole thickness in such area, said recessed area being connected to said cooling passageway to enhance the cooling effect through the recessed area in said cathode pole structure to readily cause magnetic saturation in said cathode pole structure adjacent to said recessed portion and through a ferromagnetic target in position on said cathode pole structure when a magnetic field is created by said magnetic means, means for passing a coolant through the passageway to cool said cathode pole structure and the target, and means sealing the front side of said cathode pole structure so that the coolant does not come into direct contact with a target in position on said cathode pole structure and so that the coolant remains contained when a target is not in place on said cathode pole structure or in the event that a target is eroded through by the sputtering of material therefrom.

5,180,479
ELECTRO-KINETIC SEPARATION WITH ENLARGED INPUT MIXING CAPILLARY

Donald J. Rose, Jr., Mountain View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 1, 1991, Ser. No. 649,778
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—299 R 5 Claims



1. A chemical analysis system comprising

sample path means for defining a longitudinally extending sample path, said sample path means including:

a separation capillary with an input end and an output end:

a mixing capillary having an input end and a mixing section:

a detection section positioned after said mixing section:

wherein said input end of said mixing capillary is radially enlarged relative to the remainder of said mixing capillary, an inner diameter of said input end of said mixing capillary is larger than an outer diameter of said output end of said separation capillary, and

said output end of said separation capillary is positioned within said input end of said mixing capillary for defining an annular gap therebetween;

sample movement means for moving plural components through said separation capillary at respective rates and through said mixing section and into said detection section;

detection means for detecting said plural components in a detection fluid in said detection section; and

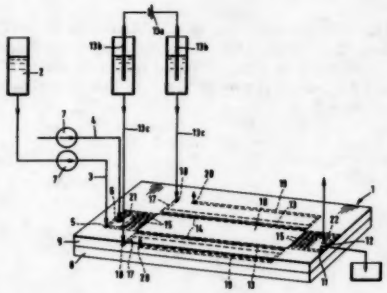
detection fluid introduction means for introducing the detection fluid into said mixing section via said annular gap so that said detection fluid mixes with said plural components.

5,180,480
APPARATUS FOR THE PREPARATION OF SAMPLES, ESPECIALLY FOR ANALYTICAL PURPOSES

Andreas Manz, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 13, 1992, Ser. No. 819,708
Claims priority, application European Pat. Off., Jan. 28, 1991, 91810062
Int. Cl.[5] G01N *27/26*; B01D *57/02*
U.S. Cl. 204—299 R 16 Claims

1. An apparatus (1) for the preparation or extraction of samples, for analytical purposes from a liquid and/or using a carrier liquid, wherein the apparatus (1) comprises, etched or machined into an approximately plate-shaped body (8), an essentially planar flow bed (10) having at least one inlet (5,6) and one outlet (11,12), which are arranged at opposing ends in the direction of flow, and having a cover covering the margins of the flow bed (10) and the bed itself, wherein recesses that serve as electrode chambers (13) and are connected to a current source (13a) are etched or machined into the plate-shaped body (8) at both sides of and parallel to the flow bed (10), and wherein there are provided between the flow bed (10) and the electrode chambers (13) fine channels (14) which are etched or machined into plate-shaped body (8), the fine channels (14) are arranged adjacent to one another and extend transversely to

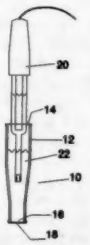


the direction of flow and to the direction in which the flow bed (10) extends.

5,180,481
PHOSPHATE SELECTIVE COMPOSITION AND ELECTRODE

Clifton Carey, 116 Meem Ave., Gaithersburg, Md. 20877

Filed Mar. 24, 1992, Ser. No. 856,689
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—416 6 Claims



1. A dibasic phosphate ion selective membrane electrode comprising:

a) a conductive body member having an opening therein,

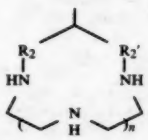
b) a membrane covering the opening comprising an ionophore represented by the following formulas:

$$R_1—X— \quad (1)$$

or

$$X—Z—X \quad (2)$$

wherein R_1 is H or a hydrophobic substituent, Z is a spacing unit and X is represented by the formula:



wherein n=0 or 1 and R_2 and R'_2 are independently selected from the group consisting of CH_2, C(O) or C(S),

c) a reference solution contained within said body member, and

d) a reference electrode disposed with said body member in contact with the reference solution.

5,180,482

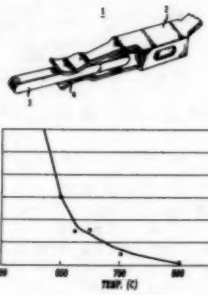
THERMAL ANNEALING OF PALLADIUM ALLOYS

Joseph A. Abys, Warren; Igor V. Kadija, Ridgewood; Joseph J. Maisano, Jr., Denville, and Shohei Nakahara, North Plainfield, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 22, 1991, Ser. No. 733,492

Int. Cl.[5] C25D *5/50*

U.S. Cl. 205—224 **8 Claims**



1. The process of fabricating an electrical device having at least one contact comprising a conductive region, which comprises,

electroplating on at least a portion of a metal base a plated deposit layer comprising from 20 to 80 mole percent palladium remainder nickel, subjecting at least the plated portion to an annealing process, permitting the annealed sample to cool to room temperature, and forming the plated metal base into a desired form, said annealing and cooling steps being conducted in an inert atmosphere, wherein,

prior to said forming step, at least the plated portion is subjected to an annealing process,

said annealing is a Rapid Thermal Anneal (RTA) heat treatment which comprises raising the plated portion from the plating temperature to a temperature within a range from 575° to 800° C. within a period of time ranging from 1 second to 30 seconds and maintaining the plated portion at said holding temperature for a period of from 1 to 30 seconds, the total time of heat-treatment being sufficient to anneal the plated deposit so as to eliminate cracking of the deposit as the result of the forming step but insufficient to result in the loss of spring in the metal base.

5,180,483

DEWAXING PROCESS

Johannes F. H. Braams, and Marinus J. Reynhout, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 27, 1991, Ser. No. 766,254

Claims priority, application Netherlands, Oct. 23, 1990, 9002305

Int. Cl.[5] C10G *73/02, 73/06*

U.S. Cl. 208—28 **20 Claims**

1. A process for dewaxing a wax-containing hydrocarbon oil comprising the steps of precipitating and separating the wax from said hydrocarbon oil, wherein said precipitating step is conducted in the presence of a linear polymer of carbon monoxide with one or more olefins comprising α-olefins with at least 10 carbon atoms per molecule (C_{10+} α-olefins), wherein in said polymer, monomer units of carbon monoxide and olefins are present in a substantially alternating arrangement.

5,180,484

CAUSTIC FREE LIQUID/LIQUID PROCESS FOR SWEETING A SOUR HYDROCARBON FRACTION

Robert R. Frame, Glenview; Jeffery C. Bricker, Buffalo Grove; Laurence O. Stine, Western Springs, and Thomas A. Verachtert, Wheeling, all of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 572,824, Aug. 27, 1990, Pat. No. 5,093,296. This application Nov. 29, 1991, Ser. No. 799,798

Int. Cl.[5] C10G *27/10, 29/00*

U.S. Cl. 208—189 **8 Claims**

1. A process for sweetening a sour hydrocarbon fraction containing mercaptans consisting essentially of contacting the hydrocarbon fraction in the presence of an oxidizing agent with an aqueous solution containing ammonium hydroxide, a metal chelate and an onium compound selected from the group consisting of quaternary ammonium, phosphonium, arsonium, stibonium, oxonium, and sulfonium compounds having the formula,

$$[R'R''R_yM]^+X^-$$

where R is a hydrocarbon group containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, and aralkyl, R' is a straight chain alkyl group containing from about 5 to about 20 carbon atoms, R'' is a hydrocarbon group selected from the group consisting of aryl, alkaryl and aralkyl, M is nitrogen, phosphorus, arsenic, antimony, oxygen or sulfur, X is an anion selected from the group consisting of halide, nitrate, sulfate, phosphate, acetate, citrate and tartrate, and y is 1 when M is oxygen or sulfur and y is 2 when M is phosphorus, arsenic, antimony or nitrogen.

5,180,485

SEPARATION OF INDOLE FROM HYDROCARBONS

Filippo Pennella; Fan-Nan Lin, and Marvin M. Johnson, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 10, 1991, Ser. No. 757,375

Int. Cl.[5] C10G *25/00, 25/02, 25/12*

U.S. Cl. 208—254 R **14 Claims**

1. A process for at least partially removing indole from a fluid comprising at least one hydrocarbon and indole which comprises the step of contacting said fluid with a sorbent composition comprising more than about 50 weight percent mangesia, at a temperature in the range of about 10° C. to about 100° C.

5,180,486

POTENTIAL FLOW CENTRIFUGAL SEPARATOR SYSTEM FOR REMOVING SOLID PARTICULATES FROM A FLUID STREAM

Leo A. Smolensky, Concord, and S. Ronald Wysk, Stow, both of Mass., assignors to LSR Environmental Systems Company, Concord, Mass.

Filed Nov. 28, 1989, Ser. No. 442,505

Int. Cl.[5] B01D *45/12, 50/00*

U.S. Cl. 210—195.1 **15 Claims**

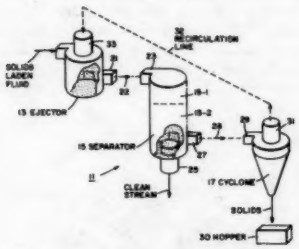
1. Apparatus constructed and arranged for removing solid particulates from a solid particulate-laden fluid stream comprising:

a. a centrifugal separator arranged for splitting the solid particulate-laden fluid stream into a clean fluid stream and a concentrated solid particulate-laden fluid stream, said centrifugal separator being cylindrically shaped and having a tangential inlet, and axial outlet and a sidewall, said solid particulate-laden fluid stream entering said centrifugal separator through said tangential inlet, said clean fluid stream exiting said centrifugal separator through said axial outlet, said sidewall being constructed to provide an outlet to enable passage through of said concentrated solid particulate-laden fluid stream, said centrifugal separator having no conical parts, no surfaces normal to the centrifugal separator axis in immediate proximity to the axial outlet

and no means for producing flow U-turns within said centrifugal separator,

b. a solids collector separate from the centrifugal separator and arranged for receiving the concentrated solid particulate-laden fluid streams from said centrifugal separator, extracting solid particulates therefrom and producing as a result thereof a fluid stream having a reduced solid particulate content, and

c. means for mixing said fluid stream having a reduced solid particulate content back with said particulate-laden fluid stream upstream of said centrifugal separator, said means including an ejector.



5,180,487

PUMP APPARATUS FOR TRANSFERRING A LIQUIFIED GAS USED IN A RECYCLE CHROMATOGRAPH

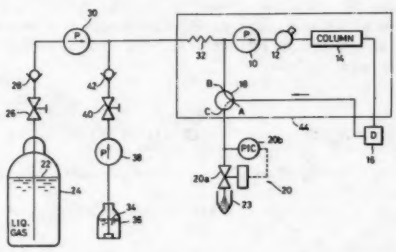
Muneo Saito, Hachioji, and Yoshio Yamauchi, Hini, both of Japan, assignors to Nihon Bunko Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 471,021, Jan. 25, 1990, abandoned, which is a continuation of Ser. No. 249,003, Sep. 23, 1988, abandoned. This application Jun. 17, 1991, Ser. No. 715,880

Claims priority, application Japan, Sep. 25, 1987, 62-240360

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 **4 Claims**



1. A recycle chromatograph with supercritical fluid as a mobile phase comprising:

a recycling pump (**10**) for transferring a mobile phase at a predetermined flow rate;

a sample injector (**12**) having an inlet connected to an outlet of said recycling pump via a flow line;

a first column (**14**) having an inlet connected to an outlet of said sample injector via a flow line, said first column being filled with a stationary phase;

a detector (**16**) having an inlet connected to an outlet of said column via a flow line, said detector detecting the components of a sample;

flow line switching means (**18**) having an inlet connected to an outlet of said detector via a flow line, while one of two outlets of said flow line switching means is connected to said recycling pump via a flow line, said two outlets being selectively connected to said inlet thereof;

a first back-pressure regulator (**20**) having an inlet connected to another of said flow line switching means via a flow line, an outlet of which is connected to the atmosphere;

pressurizing pump means (**30**) connected to a flow line between said one of said two outlets of said flow line switching means and an inlet of said recycling pump via a flow line, said pressurizing pump means supplying a mobile phase to said recycling pump so that supplied mobile phase pressure becomes a predetermined pressure;

a first pump (**30A**) for transferring a liquefied gas to a predetermined flowrate; and

a second back-pressure regulator (**48**) connected to the outlet flow line of said first pump via a flow line, said second back-pressure regulator maintaining the back pressure at a predetermined level.

5,180,488

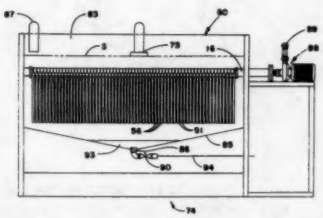
FILTER SCREEN ASSEMBLY AND METHOD OF FILTERING CONSTITUENTS FROM FLUID MIXTURES

Gerald P. Dietrick, and Michael J. Vagedes, both of Walton, Ky., assignors to Venture Production Company, Walton, Ky.

Continuation-in-part of Ser. No. 354,487, May 19, 1989, Pat. No. 5,000,846. This application Feb. 13, 1991, Ser. No. 654,728

Int. Cl.[5] B01D *29/41*

U.S. Cl. 210—232 **20 Claims**



1. A filter screen assembly for removing particulate material from a slurry which comprises a pair of filter plates each having a plurality of slots therein, a hook member along an edge of each of the plates, a collector tube having slots therealong, each of the slots of the collector tube receiving the hook member of one of the plates so that the plates are mounted on the collector tube, means for closing one end of the collector tube, means for connecting other edges of the plates to form chambers therebetween, means forming a passageway communicating between each chamber and the interior of the collector tube, and means for impressing a reduced pressure on the interior of the collector tube to cause liquid and particles of the slurry as can pass through the slots of the plates to be drawn through the slots of the plates, the slotted surfaces of the plates being oriented so particulate material not drawn through the slots of the plates falls and does not collect on the outside of the slotted portions of the plates to form a filter cake.

5,180,489

FILTER CARTRIDGE HAVING INTERNAL LIQUID TRAP

Edmund B. Bourgeois, 29354 Merrick, Warren, Mich. 48092

Filed Sep. 4, 1991, Ser. No. 754,564

Int. Cl.[5] B01D *29/15*

U.S. Cl. 210—238 **15 Claims**

15. A filter cartridge assembly for filtering liquid comprising:

a housing having a top end, a bottom end, a liquid inlet disposed at said bottom end, and a liquid outlet;

said top and bottom ends each being substantially in the shape of a disk:

said housing having a cylindrical outer wall extending be-

tween said top and bottom ends and including perforations defining said outlet;

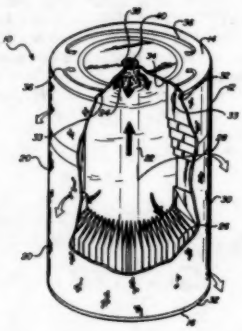
a liquid conducting conduit in fluid communication with said inlet, one end of said conduit being fixedly attached to and in sealed engagement with said bottom end about said inlet;

said conduit extending upwardly from said inlet to said top end of said housing and being fixedly attached to said top end of said housing;

said top end including a top hole in communication with said conduit so that said inlet, said conduit and said top hole define a continuous path;

a minor portion of said conduit including a plurality of holes adjacent said top end for allowing liquid to flow into said cartridge, a major portion of said conduit being imperforate and extending continuously between said minor portion and said inlet at said bottom end to force all liquid entering at said bottom end to exit said plurality of holes;

a pleated filter having a generally cylindrical shape, said



filter being fixedly attached to and extending continuously between said top and bottom ends and located between said cylindrical outer wall and said conduit to define a continuous wall of filtration material between said top and bottom ends;

said assembly including an epoxy between said top end and said outer wall and between said bottom end and said outer wall for sealingly securing said top and bottom ends of said outer wall;

the major portion of said conduit below said plurality of holes, said filter media and said bottom end together defining a trap for trapping liquid and particles flowing into said housing whereby contaminated liquid flows into said filter cartridge through said inlet and said bottom, flows up said conduit, passes through said plurality of holes, flows through said filter media and out of said housing so that none of the dirty liquid entering said filter cartridge through said plurality of holes may escape said cartridge without passing through said filter media and thus becoming filtered.

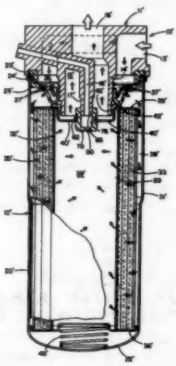
5,180,490

LUBRICANT FILTER ASSEMBLY WITH INTERNAL BYPASS LOCK-OUT

John A. Eihusen, and Roy A. Jared, both of Kearney, Nebr., assignors to Baldwin Filters, Inc., Kearney, Nebr.

Filed Jan. 31, 1992, Ser. No. 828,555
Int. Cl.[5] B01D *27/08*
U.S. Cl. 210—239 **4 Claims**

4. An oil filter assembly comprising an adaptor and further comprising a spin-on cartridge attached releasably to said adaptor, said adaptor having an externally threaded neck defining a first outlet and having a conduit disposed within and coaxial with said neck and defining a second outlet, said adaptor also having an inlet for introducing oil to said cartridge, said cartridge comprising a canister having an open end and an opposite closed end, an end plate on the open end of said canister and having an internally threaded opening receiving said neck and detachably securing said canister to said adaptor, inlet openings in said end plate for admitting oil from said inlet into said canister, a tubular filter disposed in said canister in radially spaced relation therewith, an end cap on said filter adjacent said end plate and preventing oil from said inlet opening from flowing directly into the interior of said filter whereby such oil is forced to flow through said filter to the interior thereof, outlet openings in said end cap and communicating with said first outlet in said neck to permit oil in the interior of said filter to flow to said first outlet, means sand-



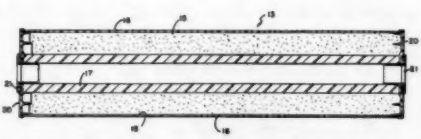
wiched between said end plate and said end cap and encircling said neck to seal said first outlet and said outlet openings from said inlet openings, a hole extending through said end cap and aligned with said conduit, a plug fixed within and sealing said hole and having a closed end portion located within the interior of said filter to prevent oil in the interior of said filter from flowing through said end cap other than by way of said outlet openings, and a blind bore in said plug and telescopically receiving said conduit to prevent oil flowing out of said outlet openings from flowing into said conduit and to force such oil to flow to said first outlet, the closed end portion of said plug preventing oil in the interior of said filter from flowing into said bore and said conduit.

5,180,491

APPARATUS FOR REMOVAL OF IRON FROM DRINKING WATER

Ralph A. Polasky, Ripon, Wis., assignor to Ametek, Inc., Sheboygan, Wis.

Filed Jun. 6, 1991, Ser. No. 711,330
Int. Cl.[5] B01D *27/02*
U.S. Cl. 210—282 **1 Claim**



1. An iron removal cartridge filter element for a drinking water supply comprising:

a porous cylindrical outer sleeve;

a porous cylindrical inner tube;

said outer sleeve and inner tube mounted concentrically to define therebetween an annular cylindrical chamber en-

closed by impervious sealing means joining the adjacent axial ends of said sleeve and tube; and,

a bed of granular iron-oxidizing material fines substantially filling said annular chamber, said bed comprising particulate manganese-treated sodium aluminosilicate, the major portion of which has a particle size int he range of 30 to 100 mesh.

5,180,492

HYDROPHILIC POROUS MATERIAL STERILIZABLE WITH GAMMA-RAY

Makoto Ohnishi, and Kenichi Shimura, both of Ashigarakami, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 554,467, Jul. 19, 1990, abandoned. This application Jun. 17, 1991, Ser. No. 716,287

Claims priority, application Japan, Jul. 21, 1989, 1-187319

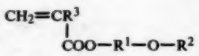
Int. Cl.[5] B01D *29/00, 39/00*

U.S. Cl. 210—490 **5 Claims**

1. A γ-ray-sterilizable hydrophilic porous composition which comprises:

a porous substrate having a continuous layer made of a synthetic polymer compound and a plurality of fine pores; and

a hydrophilic and γ-ray-resistant polymer formed of a monomer containing at least one monomer represented by the following general formula I:



wherein R^1 is an alkylene group or a polymethylene group each of 1 to 4 carbon atoms, R^2 is an alkyl group of 1 to 2 carbon atoms or an alkoxyalkyl group of 2 to 4 carbon atoms, and R^3 is a hydrogen atom or a methyl group, said hydrophilic polymer being formed on at least part of the surface of the porous substrate in an amount not less than 5% by weight, based on the porous substrate,

wherein the hydrophilic porous composition has an average pore diameter in the range of 0.02 to 20 μm, a porosity in the range of 10 to 90% and a thickness in the range of 10 μm to 5.0 mm.

5,180,493

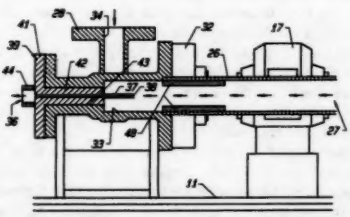
ROTATING HYDROCYCLONE SEPARATOR WITH TURBULENCE SHIELD

Donald F. Grieve, La Honda, Calif., assignor to Krebs Engineers, Menlo Park, Calif.

Filed Sep. 16, 1991, Ser. No. 760,590

Int. Cl.[5] B01D *45/12, 17/038*

U.S. Cl. 210—512.3 **16 Claims**



1. In a hydrocyclone for separating immiscible fluids of different specific gravities: an elongated cylinder having a side wall defining a separation chamber, an inlet with means for introducing a mixture of immiscible fluids into the chamber at high velocity in a tangential direction so that the mixture rotates about the axis of the chamber and produces a centrifugal force which tends to separate the fluids in accordance with their specific gravities with a fluid of lesser specific gravity forming into a core along the axis and a fluid of greater specific gravity being concentrated toward the side wall of the chamber, means for rotating the cylinder about its axis to increase the centrifugal force, a first outlet aligned with the axis of the cylinder for removing the core of fluid of lesser specific gravity from the chamber, a second outlet for removing the fluid of greater specific gravity from the chamber, and a cylindrical turbulence shield of greater diameter than the first outlet positioned between the inlet and the first outlet for isolating the core from the effects of turbulence produced by fluids entering the chamber as the core approaches the first outlet.

5,180,494

METHOD OF CONTROLLING WASTE WATER TREATMENT BY ANAEROBIC FERMENTATION

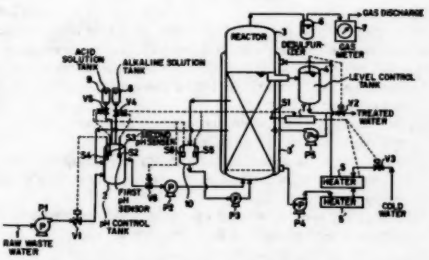
Makoto Yamaguchi, Tokyo, Japan; John Hake, Oakland, Calif.; Kazuo Okamura, and Kiyoshi Minami, both of Tokyo, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1990, Ser. No. 593,158

Claims priority, application Japan, Oct. 9, 1989, 1-263762; Oct. 9, 1989, 1-263763

Int. Cl.[5] C02F *11/04*

U.S. Cl. 210—603 **2 Claims**



1. A method of controlling waste water treatment by anaerobic fermentation, comprising:

continuously measuring the enzyme activity in the water treated by the anaerobic fermentation; and

controlling various fermentation conditions as occasion demands on the basis of the result of the measurement.

5,180,495

WATER PURIFICATION PROCESS

Markus Thüer, Rheinfelden; Gerhard Stucki, Ormalingen, and Roland Boss, Bubendorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 3, 1991, Ser. No. 695,373

Claims priority, application Switzerland, May 8, 1990, 1554/90

Int. Cl.[5] C02F *3/08, 3/30*

U.S. Cl. 210—605 **15 Claims**

1. A process for purifying water, which comprises passing the water, which is polluted by a mixture of halogenated hydrocarbons, present in a concentration range of 10 μg/l–10 g/l of water, through at least two reactors (treatment stages) packed with a porous material populated by one or more microorganisms, one of the reactors being operated under anaerobic conditions and being followed by an aerobically operated reactor.

5,180,496

UNSATURATED POLYESTERS AND CROSSLINKED MEMBRANES THEREFROM FOR AROMATICS/SATURATES SEPARATION

Guido Sartori; W. S. Winston Ho, both of Annandale, and Robert E. Noone, Neshanic Station, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 775,887, Oct. 11, 1991. This application Apr. 16, 1992, Ser. No. 871,202

Int. Cl.[5] B01D *61/00*

U.S. Cl. 210—654 **4 Claims**

1. A method for separating mixtures of aromatics and non-aromatics into aromatic-enriched and non-aromatic-enriched streams comprising:

a) contacting said aromatics/non-aromatics mixture with one side of a crosslinked membrane prepared by reacting an oligomeric polyester diol with an unsaturated diacid chloride, and

b) selectively permeating the aromatic component of the mixture through the membrane.

5,180,497

METHOD FOR DECOLORIZATION OF WASTE WATER

Yoshiteru Sando; Eiichi Nakano, and Hiroshi Ishidoshiro, all of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Sep. 11, 1991, Ser. No. 757,893

Claims priority, application Japan, Nov. 22, 1990, 2-320137

Int. Cl.[5] C02F *1/56*

U.S. Cl. 210—665 **1 Claim**

1. A method for the decolorization of waste water which contains colored matter selected from the group consisting of dyestuffs, pigments, and combinations thereof, comprising:

a) admixing polyvinylalcohol with the waste water to absorb the colored matter;

b) admixing a precipitant to the mixture from step a) to insolubilize the colored matter;

c) admixing a coagulant selected from the group consisting of ammonium persulfate and borate to insolubilize the polyvinylalcohol; and

d) separating the insolubilized polyvinyl alcohol and colored matter absorbed therein from the waste water.

5,180,498

POLYMERS FOR THE TREATMENT OF BOILER WATER

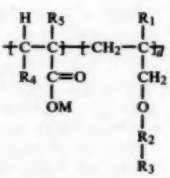
Fu Chen, Newtown, Pa.; Scott M. Boyette, Wilmington, Del., and Keith A. Bair, Horsham, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Jan. 28, 1992, Ser. No. 827,197

Int. Cl.[5] C02F *5/14*

U.S. Cl. 210—697 **28 Claims**

1. A method of controlling the deposition of scale imparting precipitates on the structural parts of a system exposed to an aqueous medium containing scale imparting precipitates including calcium, magnesium and iron under steam generating conditions comprising adding to the aqueous medium an effective amount for the purpose of a water soluble polymer having the structure



wherein R_1 is H or lower (C_1–C_4) alkyl, R_2 is $(CH_2—CH_2—O)_n$, n is an integer of from about 10 to about 15, R_3 is H, lower (C_1–C_4) alkyl or an acetate, R_4 is H, R_5 is H, M is H or a water soluble cation, the ratio of c:d being from about 3:1 to about 1:1 and with the water soluble polymer having a chelation value below 200.

5,180,499

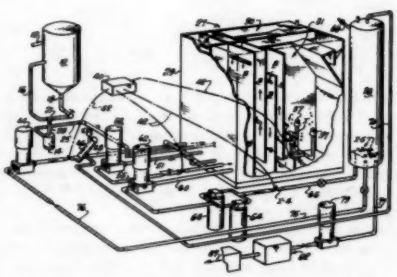
PROCESS FOR REMOVAL OF SOLID, CHEMICAL AND BACTERIAL WASTE FROM WATER

Charles Hinson, Fresno, Calif., and Gaylen LaCrosse, Brussels, Wis., assignors to Envirozone Technologies, Inc., Clovis, Calif.

Filed Oct. 17, 1990, Ser. No. 599,024

Int. Cl.[5] C02F *1/24, 1/32, 1/78*

U.S. Cl. 210—706 **9 Claims**



1. A two-stage, multi-phase process for removal of solid, chemical and bacterial waste from contaminated aqueous fluid comprising the steps of:

introducing contaminated fluid to a chamber defining a first, solid waste clarifier stage by injection into a portion of a chamber in a spray pattern;

bombarding said spray with a gaseous oxidant in the form of small bubbles in quantities sufficient to supersaturate said spray with said gaseous oxidant;

mixing said gaseous oxidant and said contaminated fluid so as to effect maximum contact to thereby cause flocculation of said gaseous oxidant, and solids in said water;

removing flocculated solids form the top of said chamber, leaving a resultant treatment fluid;

passing said treatment fluid under pressure to a second, chemical and bacterial removal stage, filtering said treatment fluid to remove smaller particulate matter; and injecting further gaseous oxidant to supersaturate said treatment fluid therewith;

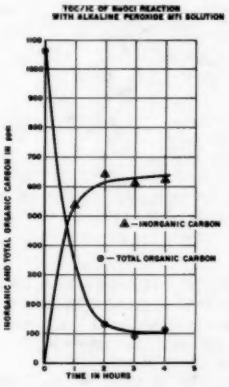
introducing said filtered treatment fluid into a fluid body at atmospheric pressure, causing said gaseous oxidant to expand and thoroughly intermix with said filtered treatment fluid so as to break down and destroy chemical and organic matter contained in the filtered fluid;

drawing off a portion of the mixed fluid in said fluid body, while recirculating the remainder thereof to said first solid waste clarifier stage, resaturating said recirculated mixed fluid with oxidant and exposing the portion of mixed fluid drawn off to ultraviolet light, and thereafter degassifying said mixed fluid to complete purification thereof.

5,180,500
CHEMICAL REMOVAL OF THIOUREA FROM HYDROCHLORIC ACID

Stanley B. McConnell, Broken Arrow, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Continuation-in-part of Ser. No. 69,375, Jul. 2, 1987, Pat. No. 4,822,494. This application Apr. 4, 1989, Ser. No. 333,165
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[5] C02F *1/76*
U.S. Cl. 210—721 **16 Claims**


TOC/IC OF BuOCl REACTION WITH ALKALINE PEROXIDE BTI SOLUTION
INORGANIC AND TOTAL ORGANIC CARBON IN ppm
TIME IN HOURS
▲—INORGANIC CARBON
●—TOTAL ORGANIC CARBON

1. A method of removing thiourea from a thiourea containing acid solution comprising the stage of:

(a) adding an effective amount thereof to a Group Ia hydroxide, Group IIa hydroxide or a mixture thereof to adjust the pH to not less than about 12, thus precipitating any alkaline insoluble metal hydroxides present in said acid solution producing an alkaline thiourea containing solution and separating said metal hydroxides from said alkaline thiourea containing solution;

(b) adding an effective amount of ozone to the alkaline thiourea containing solution produced in step (a), thus oxidizing the thiourea to urea; and

(c) adding an effective amount of a hypohalite, salt MOX where M is a Group Ia or Group IIa element and X is a halogen, to the alkaline urea containing solution produced in step (b) according to the reaction,

$$H_2N-\overset{\overset{O}{\|}}{C}-NH_2 + 3MOX + 2OH^- \longrightarrow$$

$$N_2 + 3M + CO_3^- + 3X^- + 3H_2O.$$

5,180,501
FLOATING AQUATIC PLANT WATER TREATMENT SYSTEM

Viet H. Ngo, Minneapolis; Warren D. Poole, St. Paul; Sean J. Hancock, Eagan, and Timothy T. France, Oakdale, all of Minn., assignors to The Lemna Corporation, Mendota Heights, Minn.

Division of Ser. No. 323,022, Mar. 17, 1989, Pat. No. 5,096,577. This application Jun. 20, 1991, Ser. No. 717,983
Int. Cl.[5] C02F *3/32*
U.S. Cl. 210—747 **8 Claims**

1. A method of deploying a floating point containment system at a deployment site comprising the steps of:

attaching a floating barrier segment to adjacent barrier segments by inserting a hollow connecting tube through a hole at meshing ends of the barrier segments to form a Z-fold bundle;

transporting the Z-fold bundles to the deployment site;

attaching adjacent Z-fold bundles by inserting a U-bolt through the hollow connecting tubes of the Z-fold bundles and the adjacent Z-fold bundles;

towing the attached Z-fold bundles onto the water surface;

stretching the attached Z-fold bundles laterally from the towing direction to cover the water surface;

adding Z-fold bundles until a sufficient number are attached to form a deployed grid which covers the water surface; and

securing the deployed grid to shore.

2. A reversible floating grid segment comprising:

a barrier portion;

connecting portions, extending from the ends of the barrier portion of the grid segment, the connecting portions extending at an angle of greater than 0 degrees from the longitudinal axis of the barrier portion, the connecting portions including finger portions having apertures therethrough such that the finger portions mesh with the finger portions of an adjacent grid segment such that the apertures are aligned with one another, wherein the grid segments may be connected by inserting connecting means into the apertures of the finger portions of adjacent grid segments; and

flotation chambers spaced along the barrier portion of the grid segment wherein the chambers are spaced so that the flotation chambers do not contact flotation chambers of an adjacent connected grid segment when the grid segment is connected to the adjacent grid segment and when the segments are folded about the connected finger portions.

5,180,502
ELECTROLYTIC OZONIZER AND METHOD OF DECOMPOSING OZONE-CONTAINING WASTE GAS USING SAID OZONIZER

Yoshinori Nishiki; Isao Sawamoto; Shuji Nakamatsu, all of Kanagawa, and Takayuki Shimamune, Tokyo, all of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Continuation of Ser. No. 349,673, May 10, 1989, abandoned. This application May 13, 1991, Ser. No. 701,014
Claims priority, application Japan, May 11, 1988, 63-114388
Int. Cl.[5] C02F *1/78*
U.S. Cl. 210—748 **2 Claims**

1. An electrolytic ozonizer comprising:

an electrolytic cell in which oxygen and ozone are evolved in an anode compartment by electrolysis of water, and hydrogen is evolved in a cathode compartment, including means for separating the evolved oxygen and ozone gas from the water electrolyte and means for separating the evolved hydrogen gas from the water electrolyte;

a waste gas decomposing section being connected to said anode compartment of said electrolytic cell and being connected to said cathode compartment, wherein said waste gas decomposing section comprises a hollow member filled with a hydrogen conversion catalyst, said hollow member comprises a conduit for passage of waste gas, and said conduit penetrates said hollow member transversely in such a way that waste gas in the conduit makes indirect contact with said catalyst via the wall of said conduit;

an ozone contactor for treating a medium with the said oxygen and ozone gas evolved in the anode compartment

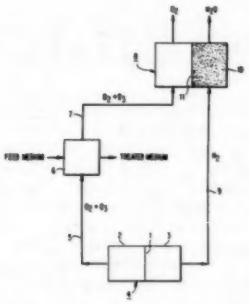
and separated from the water electrolyte, including means for directing the said oxygen and ozone gas separated from the water electrolyte to the ozone contactor and means for separating ozone-containing waste gas from the medium being treated, said contactor being interposed between said anode compartment and said waste gas decomposing section;

wherein ozone-containing waste gas which is produced as a result of treatment of a medium in said ozone contactor and said hydrogen gas evolved in said cathode compartment, are converted to a harmless form.

2. A method of treating waste gas comprising the steps of:

evolving oxygen and ozone in an anode compartment of an electrolytic cell by electrolysis of water while evolving hydrogen in a cathode compartment;

separating the evolved oxygen and ozone gas and the



evolved hydrogen gas from the water electrolyte of the electrolytic cell;

directing the evolved hydrogen into a waste gas treating section that contains a waste gas decomposition catalyst so as to convert said hydrogen into a harmless form by means of said catalyst;

bringing said oxygen and ozone into contact with a medium to be treated in an ozone contactor so as to treat said medium;

separating waste gas containing oxygen and ozone from the treated medium; and

directing waste gas containing oxygen and ozone produced as a result of treatment of said medium into said waste gas treating section where they are brought into indirect contact with said catalyst so as to decompose ozone in said waste gas with heat generated by conversion of said hydrogen to produce oxygen.

5,180,503

IN-SITU VAPOR STRIPPING FOR REMOVING VOLATILE ORGANIC COMPOUNDS FROM GROUNDWATER

Steven M. Gorelick, San Carlos, Calif., and Haim Gvirtzman, Modi'im Mobile Post, Israel, assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

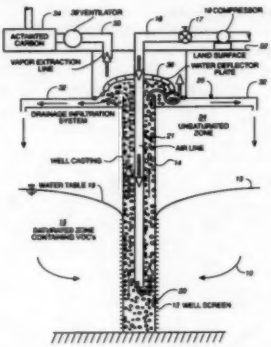
Filed May 10, 1991, Ser. No. 698,409
Int. Cl.[5] C02F *1/20*
U.S. Cl. 210—758 **23 Claims**

23. A method of removing volatile organic compounds (VOCs) from groundwater, comprising:

(a) injecting gas into a well to cause groundwater to flow towards the well and to cause VOCs to be transferred from the groundwater to rising gas bubbles in the well;

(b) near the top of the well, separating the gas bubbles including VOC vapor from the groundwater rising in the well;

(c) after separation from the groundwater, collecting the VOC vapor;



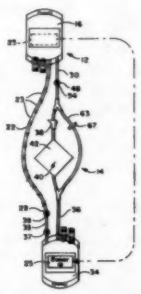
(d) treating or destroying the VOC vapor; and (e) after said collecting, directing the groundwater into a vadose zone.

5,180,504

SYSTEMS AND METHODS FOR REMOVING UNDESIRED MATTER FROM BLOOD CELLS

Kenneth M. Johnson, Lindenhurst, and Samira E. Monaghan, Lake Zurich, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed May 22, 1991, Ser. No. 704,077
Int. Cl.[5] B01D *37/00*
U.S. Cl. 210—767 **13 Claims**



1. A method of collecting blood substantially free of undesired matter comprising the steps of

collecting blood containing the undesired matter in a blood collection container that includes a tube having one end attached to the collection container and a free distal end,

transferring a sample of the blood from the collection container into the attached tube through the distal end,

sealing the distal end of the tube to retain the blood sample within the tube for subsequent analysis,

attaching the sealed distal end of the tube to a transfer container that also includes attached transfer tubing that leads into the transfer container, the transfer tubing including means for separating undesired matter from the blood,

opening communication between the blood collection container and the transfer tubing to convey at least a portion of the collected blood from the blood collection container into the transfer container through the separation means, thereby separating undesired matter from the blood,

disconnecting the transfer container from the transfer tubing,

sealing the disconnection adjacent to the transfer container to there close the transfer container, and

disconnecting the other end of the sealed tube from the blood collection container leaving the sealed tube and, with it, the retained blood sample, attached only to the transfer container, which transfer container now holds blood substantially free of undesired matter.

5,180,505

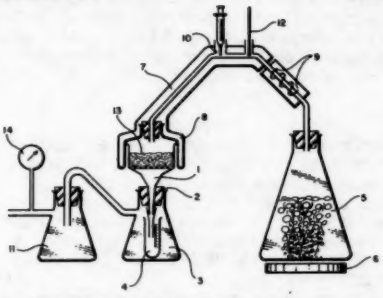
DEWATERING METHOD

Marek J. Stefanski; Maria Stefanski, both of 72 Glencair Ave., Ottawa, Ontario K1S 1M6, and Louis L. Sirois, 2 Rurual Route, Woodlawn, Ontario K0A 3M0, all of Canada

Filed Jun. 10, 1991, Ser. No. 712,547

Int. Cl.[5] B01D *37/00*; F26B *3/00*

U.S. Cl. 210—771 **20 Claims**



1. In a method of dewatering a filter cake, an improvement comprising the steps of:

(a) supplying a flow of steam to the filtered cake; and

(b) adding a surfactant to the steam whereby said surfactant is vaporized or dispersed into a fine mist and carried to the filter cake.

5,180,506

HOT TOP LINING ASSEMBLY FOR INGOT MOULDS

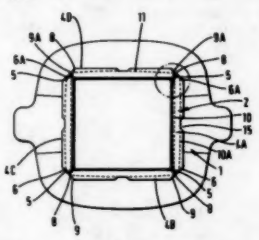
Fred M. Mulhorn, Strongsville, Ohio, assignor to Foseco International Limited, Birmingham, England

Filed Sep. 16, 1991, Ser. No. 760,135

Claims priority, application United Kingdom, Oct. 2, 1990, 9021406

Int. Cl.[5] B22D *7/10*

U.S. Cl. 249—197 **11 Claims**



1. A hot top lining assembly for an ingot mould or for an ingot mould head box made up of four boards of refractory material and fixed together by means of a guide bar incorporated in and along a wedge-shaped portion in a lateral edge of one of the boards mating with a slot in and extending along a lateral edge of an adjacent board.

5,180,507

Patent Not Issued For This Number

5,180,508

FABRIC SOFTENER RINSING AGENTS

Horst Birkhan, Steinau-Ulmbach; Hans-Juergen Köhle, Schlüchtern; Joachim Weigand, Freigericht, and Winfried Wehner, Neuhof, all of Fed. Rep. of Germany, assignors to REWO Chemische Werke GmbH, Fed. Rep. of Germany

Filed Aug. 9, 1990, Ser. No. 564,873

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1989, 3926740

Int. Cl.[5] D06M *13/46*

U.S. Cl. 252—8.8 **38 Claims**

1. An aqueous soft-rinsing agent comprising as an active ingredient an effective amount of a mixture of two soft-rinsing components containing a first component and a second component, wherein the

(a) first component is a quaternary compound of the formula:

I

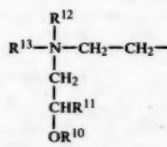
wherein

each R is independently hydrogen or alkyl containing 1–6 carbon atoms;

each R^1 is hydrogen or an alkylcarbonyl group containing 15–23 carbon atoms, provided that at least one of R_1 is an alkylcarbonyl group;

each R^3 is an alkyl group containing 1–4 carbon atoms which is unsubstituted or substituted with 1, 2, or 3 hydroxy groups;

each R^2 is an alkyl group containing 1–4 carbon atoms which may be unsubstituted or substituted with 1, 2, or 3 hydroxy groups, or is a group of the formula



II

R^{13} is an alkyl group containing 8–22 carbon atoms;

R^{12} is an alkyl group containing 1–4 carbon atoms which is unsubstituted or substituted with 1, 2, or 3 hydroxy groups;

R^{11} is hydrogen or alkyl containing 1–6 carbon atoms;

R^{10} is hydrogen or alkylcarbonyl group containing 14–22 carbon atoms;

A is an anion of a quaternizing agent;

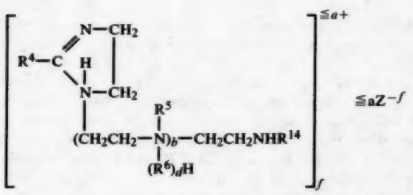
n is 0 or 1;

x and y are independently 0 or 1 with (x+y)+(3−n)=4;

m is 1 or 2; and

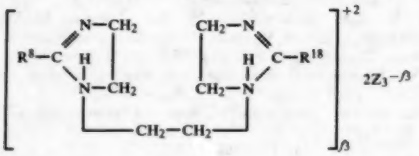
g is 1, 2 or 3;

and (b) the second component comprising at least one compound of the formula:



III

-continued



VI

wherein

R^4 is an alkyl radical having 8–22 carbon atoms;

R^5 is hydrogen or R^6;

R^6 is CHX—CHY—O;

X and Y are independently hydrogen or alkyl containing 1–6 carbon atoms with the proviso that X and Y cannot simultaneously be alkyl;

R^{14} is hydrogen or alkylcarbonyl group containing 14–22 carbon atoms;

R^8 and R^{18} are independently an alkyl group containing 11–17 carbon atoms;

Z and Z_3 are independently water-soluble monobasic or polybasic anion;

b is 1, 2, or 3;

d is 0–6;

a is b+1; and

f and f_3 are independently 1, 2, or 3.

5,180,509

METAL-FREE LUBRICANT COMPOSITION CONTAINING GRAPHITE FOR USE IN THREADED CONNECTIONS

Norman L. Jacobs, 4/24 Blaxland Rd., Bellevue Hill, Sydney N.S.W. 2023, Australia

Continuation-in-part of Ser. No. 418,024, Oct. 10, 1989, Pat. No. 5,049,289. This application Apr. 9, 1991, Ser. No. 682,276

The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.

Int. Cl.[5] C10M *125/02*

U.S. Cl. 252—22 **14 Claims**

1. A metal free lubricant composition for threaded connections which consists essentially of graphite dispersed in a lubricant base material in which a polyalkylene is dissolved, said graphite being present in an amount which is effective to decrease a coefficient of friction of said composition, and said polyalkylene being present in an amount effective to enhance formation of graphite flakes from graphite particles upon application of pressure, said composition also including a substantially non-abrasive, friction increasing adjusting component dispersed in the base material in an amount effective to increase a coefficient of friction of said composition.

5,180,510

ANTIOXIDANT ADDITIVE AND LUBRICATING OIL CONTAINING SAME

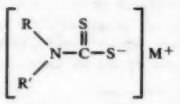
Edward F. Zaweski, and Scott A. Culley, both of Baton Rouge, La., assignors to Ethyl Petroleum Additives, Inc., Richmond, Va.

Filed Mar. 31, 1988, Ser. No. 175,522

Int. Cl.[5] C10M *135/00, 133/00*

U.S. Cl. 252—47 **3 Claims**

1. A lubricating oil composition comprising a major proportion of a mineral or synthetic lubricating oil and a minor proportion sufficient to improve its antioxidant properties of at least one lubricating oil additive made by the process of (i) reacting at a temperature of from about 30°–100° C. a sulfur halide selected from sulfur monochloride or sulfur dichloride with an aliphatic monolefin in an amount of about 0.4–1.5 gram moles of monolefin for each 0.3–0.75 gram mole of sulfur halide to produce an adduct, (ii) reacting said adduct in an aqueous alkanol medium at a temperature of about 50° C. up to reflux with an alkali metal salt of an organocarbamodithioic acid having the formula:



wherein R is an organic radical selected from an alkyl group, an alkenyl group, an aryl group or an aralkyl group in which the alkyl and alkenyl groups contain up to 32 carbon atoms and the aryl and aralkyl groups contain up to 15 carbon atoms and R′ is hydrogen or an organic radical selected from an alkyl group, an alkenyl group, an aryl group or an aralkyl group in which the alkyl and alkenyl groups contain up to 32 carbon atoms and the aryl and aralkyl groups contain up to 15 carbon atoms in an amount of from about 0.1 to 0.6 mole of adduct for each mole of alkali metal salt of organocarbamodithioic acid, and (iii) recovering said additive.

5,180,511

FLOTATION AID AND PROCESS FOR REMOVAL OF IMPURITIES FROM SILICATE MINERALS

John M. M. Harrison, Macon, Ga., assignor to J.M. Huber Corporation, Rumson, N.J.

Division of Ser. No. 407,425, Sep. 14, 1989, Pat. No. 5,037,534. This application Jun. 20, 1991, Ser. No. 718,055

Int. Cl.[5] B03D *1/018, 1/02*

U.S. Cl. 252—61 **12 Claims**

1. A composition comprising (a) a dispersed water slurry containing clay minerals and contaminants, (b) an alkali metal aluminate being present in an amount of ¼ pound to ¾ pound per ton dry weight clay present; (c) oleic acid being present in an amount of 3 pounds to 6 pounds per ton dry weight clay present; and (d) alkali hydroxide being present n an amount sufficient to maintain a pH of 8 to 9 in the water slurry of clay minerals.

5,180,512

METHOD OF MANUFACTURING FINE-PARTICLE COLLOID OR MAGNETIC FLUID

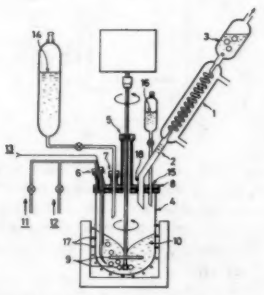
Isao Nakatani; Kiyosho Ozawa; Masayuki Hijikata, and Tsutomu Takahashi, all of Tokyo, Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Apr. 12, 1991, Ser. No. 684,387

Claims priority, application Japan, Apr. 12, 1990, 2-95178; Apr. 12, 1990, 2-95179; Nov. 22, 1990, 2-316226

Int. Cl.[5] B01J *13/00;* **C01B** *21/06;* **H01F** *1/00*

U.S. Cl. 252—62.51 **10 Claims**



1. A method of manufacturing a fine particle colloid of a metal nitride in non-aqueous solution, useful as a magnetic fluid, which comprises heating a non-aqueous solution contain-

ing a metal carbonyl and a surfactant dissolved therein while introducing a nitrogen containing compound into said non-aqueous solution, said heating being carried out at sufficient temperatures to effect a two step reaction in which metal carbonyl compound containing nitrogen is produced in the first step as a precursor and a second step in which a metal nitride is synthesized from said precursor.

5,180,513

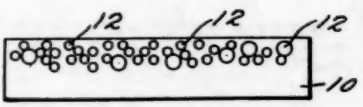
SHIELDED PLASTIC ENCLOSURE TO HOUSE ELECTRONIC EQUIPMENT

David Durand, Providence, R.I., assignor to Key-Tech, Inc., Cranston, R.I.

Division of Ser. No. 365,712, Jun. 14, 1989, Pat. No. 4,960,614, which is a continuation-in-part of Ser. No. 11,975, Feb. 6, 1987, Pat. No. 4,863,757. This application Jan. 30, 1990, Ser. No. 472,634

Int. Cl.[5] B32B *3/00*

U.S. Cl. 252—62.55 **3 Claims**



1. A shielded plastic enclosure for housing electronic equipment having at least one interior surface of said enclosure provided was a layer of a shielding composition comprising a layer of a suspension of silver-coated magnetite particles in a U.V. cured cycloaliphatic epoxy resin, wherein said shielding composition contains by volume 25 to 75 percent silver-coated magnetite spheres based on the total volume of said shielding composition, said layer having a thickness sufficient to effectively shield against electromagnetic interference, radio frequency interference or electrostatic discharge, said shielding composition having been cured by exposure to a U.V. source having an output in the region between 360 nm and 420 nm for a time sufficient to cure said cycloaliphatic epoxy resin.

5,180,514

STABILIZING SYSTEM FOR LIQUID HYDROGEN PEROXIDE COMPOSITIONS

James P. Farr, Pleasanton, and Daniel T. Carty, Danville, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation of Ser. No. 212,447, Jun. 28, 1988, abandoned, which is a continuation-in-part of Ser. No. 144,616, Jan. 11, 1988, Pat. No. 4,900,468, which is a continuation of Ser. No. 745,617, Jun. 17, 1985, abandoned. This application Dec. 6, 1990, Ser. No. 623,280

The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.

Int. Cl.[5] C11D *3/26, 3/36, 3/395, 7/38*

U.S. Cl. 252—99 **22 Claims**

1. A colored liquid peroxide bleaching composition, stabilizing against a loss of activity of a dye or a fluorescent whitening agent, comprising an aqueous composition comprising 0.05–50 wt.% of a peroxygen component, an organic component comprising 0–50 wt. % of the compositions as surfactants, several hundredths to about 5 wt. % of the composition as fluorescent whitening agent, 0.0002–1 wt. % of the composition as a dye, and mixtures thereof, and a stabilizing system comprising (a) a phosphonate or an aminopolyphosphonate as a chelating agent comprising about 0.02–5 wt. % of the composition and an aromatic amine free radical scavenging agent selected from the group consisting of substituted diarylamines, p-phenylenediamines, substituted dihydroquinolines, naphthylamines, and mixtures thereof in an amount effective to provide effective free radical scavenging.

5,180,515

GRANULAR DETERGENT COMPOSITIONS HAVING LOW LEVELS OF POTASSIUM SALT TO PROVIDE IMPROVED SOLUBILITY

Jeffrey E. Boucher, Cincinnati, and Eugene J. Pancheri, Montgomery, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 385,848, Jul. 27, 1989, abandoned. This application Feb. 14, 1991, Ser. No. 656,117

Int. Cl.[5] C11D *3/04, 17/06, 3/065*

U.S. Cl. 252—135 **17 Claims**

1. A granular laundry detergent composition or additive, comprising:

(a) from about 5 to 70 weight % anionic detergent surfactant;

(b) from about 5 to 70 weight % sodium phosphate;

(c) from about 5 to 70 weight % sodium carbonate; and

(d) from 1 to 5 weight % potassium salt.

5,180,516

HETEROCYCLIC PEROXIDES HAVING N-AMIDIC HETEROATOMS USEFUL AS BLEACHING AGENTS

Carlo Venturello, Novara, and Claudio Cavallotti, Milan, both of Italy, assignors to Ausimont S.r.l., Italy

Division of Ser. No. 366,512, Jun. 14, 1989, Pat. No. 5,041,546. This application Jul. 8, 1991, Ser. No. 727,022

Claims priority, application Italy, Jun. 14, 1988, 20957 A/88

Int. Cl.[5] C07D *223/06, 211/42, 211/44;* **C11D** *9/42*

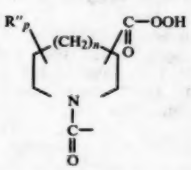
U.S. Cl. 252—186.1 **1 Claim**

1. A method of bleaching, comprising the step of contacting a substrate to be bleached with an effective amount of a heterocyclic (poly)peroxycarboxy acid having an amidic nitrogen heteroatom in the ring, and having the formula:

$$H-(CH_2)_m-R' \quad (I)$$

wherein

R′ is selected from the group:



and wherein:

R″ is selected from H, F, Cl, NO_2, and:

the carboxylic group (COOH);

C_1–C_5 alkoxy groups;

the alkyl, cycloalkyl, alkylaryl and arylalkyl groups, containing up to 10 carbon atoms and optionally bearing a substituent group selected from F, Cl, NO_2, the carboxylic group, and the (C_1–C_5) alkoxy groups;

m is an integer from 1 to 12;

n is 0 or an integer selected from 1 and 2;

p is an integer from 1 to 3, whereby the substrate is bleached.

5,180,517

STABILIZED LIQUID PERSALT BLEACH COMPOSITIONS

William G. Woods, Riverside, Calif., assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.

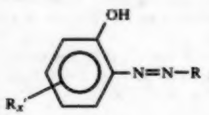
Filed Nov. 5, 1990, Ser. No. 609,272

Int. Cl.[5] C01B *15/037*

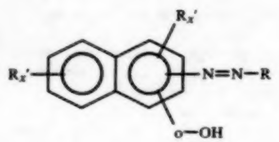
U.S. Cl. 252—186.27 **16 Claims**

1. A stable, concentrated aqueous persalt laundry bleach solution having a pH of about 5 to 8 comprising about 5 to 30%

of sodium perborate or sodium percarbonate, about 3 to 30% solubilizing agent, about 0.001 to 1.0% of an azo stabilizing agent selected from the formulas consisting of:



and



where R is selected from the group consisting of unsubstituted and substituted phenyl, unsubstituted and substituted naphthyl, unsubstituted and substituted unsaturated heterocyclic compounds containing carbon and nitrogen, wherein when substituted the substituted moiety is selected from the group consisting of at least one of amino, lower alkyl, hydroxy, and alkali metal sulfonate; R' is selected from the group consisting of nitro, amino, lower alkoxy, hydroxy, lower alkyl, halo, sufonic acid, phenylazo, carboxylic acid, ureamido, sulfamido, acetamido, acyl, alkylene and heterocylic linkages, and the salts thereof; x is 0 to about 5, and the balance of said solution is water, wherein all percentages are by weight.

5,180,518
OXYGEN ABSORBENT

Yasuo Sugihara, Kashiwa; Toshio Komatsu, Ibaraki; Takashi Kashiba; Hidetoshi Hatakeyama, both of Tokyo, and Teruo Takeuchi, Nagareyama, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed Apr. 18, 1990, Ser. No. 510,838
Claims priority, application Japan, Apr. 25, 1989, 1-103346; Apr. 25, 1989, 1-103347; Apr. 25, 1989, 1-103348; Jun. 7, 1989, 1-143014; Jun. 7, 1989, 1-143015; Jun. 7, 1989, 1-143016
Int. Cl.[5] **C09K** *15/04*
U.S. Cl. 252—188.28 **42 Claims**

1. An oxygen absorbent which is free of elemental metal comprising: (a) a 1,2-glycol; and (b) at least 10 parts of at least one alkaline substance and at least 1 part of at least one phenolic compound or quinone compound, each based on 100 parts of said 1,2-glycol.

5,180,519
ALKENYL ETHER DERIVATIVE AND LIQUID CRYSTAL COMPOSITION CONTAINING THE SAME

Manabu Uchida; Makoto Ushioda, and Yasuyuki Goto, all of Chiba, Japan, assignors to Chisso Corporation, Ohsaka, Japan

Continuation of Ser. No. 492,571, Mar. 13, 1990, abandoned. This application Mar. 29, 1991, Ser. No. 680,042
Claims priority, application Japan, Mar. 13, 1989, 1-60411
Int. Cl.[5] **C09K** *19/52, 19/30;* **C07C** *41/00*
U.S. Cl. 252—299.63 **5 Claims**

1. An alkenyl ether compound expressed by the formula

$$R_1—CH_2—O—(CH_2)n—A_1—A_2—A_3—R_2 \quad [I]$$

wherein R_1 represents an alkenyl group of 2 to 7 carbon atoms having a double bond at its terminal or a double bond of a trans configuration at a position other than its terminal, R_2 represents an alkyl group or an alkoxy group each of 1 to 10 carbon atoms, A_1 and A_2 each independently represent a 1,4-phenylene or a trans-1,4-cyclohexylene, A_3 represents a 1,4-phenylene, a trans-1,4-cyclohexylene or a single bond and n represents 1 or 2.

5,180,520
FERROELECTRIC LIQUID CRYSTAL COMPOSITIONS CONTAINING HALOGENATED CORES AND CHIRAL HALOGENATED CORES AND CHIRAL HALOALKOXY TAIL UNITS

Michael Wand; Rohini Vohra, and David Walba, all of Boulder, Colo., assignors to University Research Corporation, Boulder, Colo.

Continuation-in-part of Ser. No. 164,233, Mar. 4, 1988, Pat. No. 5,051,506. This application Jul. 20, 1990, Ser. No. 556,161
Int. Cl.[5] **C09K** *17/34;* **C07D** *239/02, 213/24*
U.S. Cl. 252—299.61 **10 Claims**

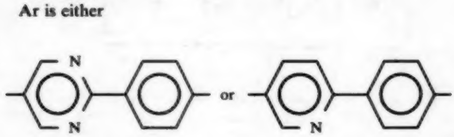
1. A chiral nonracemic compound of the general formula:

$$R_1—\underset{\underset{Z}{|}}{(Ar)}—O—CH_2—C^*HX—C^*HY—R_2$$

wherein:

R_1 is an achiral alkyl or alkenyl group of two to sixteen carbons,

Ar is either



denotes a chiral carbon, R2 comprises the distal segment of the chiral tail and has one to ten carbon atoms,

the $—O—CH_2—C^*HX—C—HY—R_2$ segment comprises the chiral proximal segment of the chiral tail, and the proximal segment is selected from the diastereomers and enantiomers:

2S,3S-dihalo;	2R,3R-dihalo; and
2R,3S-dihalo;	2S,3R-dhialo;

and Z represents one fluoride located ortho to the chiral proximal segment.

5,180,521
CHIRAL COMPOUNDS

Rudolf Eidenschink, Mühltal; Reinhard Hopf, Heringen, and Eike Poetsch, Mühltal, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/DE87/00037, § 371 Date Oct. 16, 1987, § 102(e) Date Oct. 16, 1987, PCT Pub. No. WO87/05015, PCT Pub. Date Aug. 27, 1987
Continuation-in-part of Ser. No. 116,756, Oct. 16, 1987, abandoned. This PCT application Jan. 31, 1987, Ser. No. 545,666
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1986, 3604905
Int. Cl.[5] **C09K** *19/34;* **C07D** *211/72, 239/00;* **C07C** *255/00*
U.S. Cl. 252—299.61 **20 Claims**

18. A chiral tilted smectic liquid crystal medium containing at least two liquid crystal components, wherein at least one compound is an optically active compound of the Formula Ii

$$R^1\text{-}A\text{-}Z^1\text{-}A^2\text{-}A^3\text{-}R^3 \quad (Ii)$$

wherein

R^1 is H or alkyl or 1–12 C atoms;

A is 1,4-cyclohexylene containing an asymmetric carbon

atom and substituted in the 2-, or 3 position by alkyl of 1–10 C atoms and in the 1- or 4-position by nitrile;

A^2 and A^3 are each independently (a) 1,4-cyclohexylene or (b) 1,4-phenylene which is unsubstituted or substituted by one or two F atoms and wherein, in each case, one or two CH groups can be replaced by N;

Z^1 is —CO—O—, —O—CO—, —CH_2CH_2—, —OCH_2—, —CH_2O—, or a single bond; and

R^3 is F, Cl, Br, CN, or alkyl or 1–12 C atoms, wherein one or two nonadjacent CH_2 groups can also be replaced by O atoms and/or —CO—O— groups and/or —CH=CH— groups.

5,180,522

COLLOID SOLUTION FOR PREPARING SUSPENSION HAVING BOTH FLUIDITY AND SUSPENSIBILITY

Yoshiaki Kawashima, 185, Shimotsuchii, Gifu-shi, Gifu-ken; Taro Iwamoto, Nagoya, and Kikuo Tejima, Toyoake, all of Japan, assignors to Yoshiaki Kawashima, Gifu and Showa Yakuhin Kako Co., Ltd., Tokyo, both of, Japan

Filed Mar. 4, 1988, Ser. No. 165,013

Claims priority, application Japan, Mar. 6, 1987, 62-52571

Int. Cl.[5] B01J *13/02*

U.S. Cl. 252—311 **6 Claims**

1. A colloid solution for preparing a suspension, comprising one or more components selected from Group A and one or more components selected from Group B as dispersoids, and water as a dispersant medium, the colloid solution being at a pH such that suspensoid particles added thereto are positively charged; wherein said Group A consists of xylitol, D-sorbitol, D-mannitol, lactose, saccharose, cyclodextrin, maltose, D-fructose, D-glucose and galactose; and said Group B consists of sodium carboxymethylcellulose, sodium alginate, sodium polyacrylate and gum arabic.

5,180,523

ELECTRICALLY CONDUCTIVE CEMENT CONTAINING AGGLOMERATE, FLAKE AND POWDER METAL FILLERS

David Durand, Providence; David P. Vieau, East Greenwich; Ang-Ling Chu, Cranston, and Tai S. Weiu, Warwick, all of R.I., assignors to Poly-Flex Circuits, Inc., Cranston, R.I.

Filed Nov. 14, 1989, Ser. No. 436,199

Int. Cl.[5] H01B *1/22*

U.S. Cl. 252—512 **6 Claims**

1. An electrically conductive element for establishing electrical contact between and adhering surfaces, comprising:

a polymeric carrier having a volumetric shrinkage characteristic of about 4 to about 16%; and

a filler comprising about 60 to about 90% by weight of the cement including conducive particles consisting of:

i) agglomerate particles having a mean particle size of about 4.5 microns, an aspect ratio of about 1:1:1 and a rough external appearance characterized by sufficient recesses and ridge-like boundaries so as to effect enhanced electrical contact between surfaces adhered with the cement,

ii) a mixture of flake particles hang a FSSS of about 0.90 to about 1.30 microns and a surface area of about 0.3 to 0.6 m^2/g and a particle size distribution of about 90% <14 microns, 50% <7 microns and 10% <2 microns, and

iii) powder particles having a mean particle size of about 1.6 microns.

5,180,524

PHOTOCHROMATIC COMPOSITION AND PHOTOCHROMATIC ARTICLES WHICH CONTAIN IT

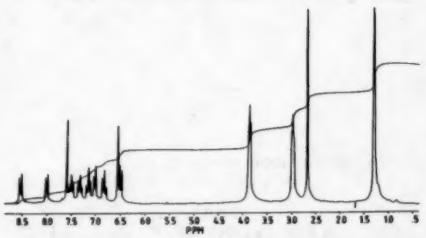
Nicola Casilli, Ravenna; Luciana Crisci, Sant'Angelo Lodigiano; Fiorenzo Renzi, Gorgonzola, and Franco Rivetti, Schio, all of Italy, assignors to Enichem Synthesis S.p.A., Palermo, Italy

Continuation of Ser. No. 264,818, Oct. 31, 1988, abandoned. This application Feb. 4, 1991, Ser. No. 650,035

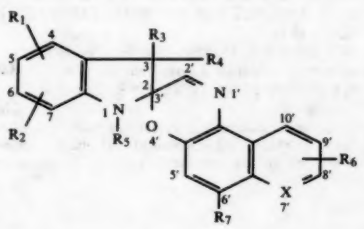
Claims priority, application Italy, Nov. 5, 1987, 22528 A/87

Int. Cl.[5] G02B *5/23;* **F21V** *9/04*

U.S. Cl. 252—586 **13 Claims**



1. A photochromatic composition comprising two photochromatic compounds selected from the group consisting of compounds of the formula:



(I)

wherein:

R_1 and R_2 are independently selected from the group consisting of hydrogen, halogen, C_1–C_5-alkoxy, nitro, cyano, linear and branched C_1–C_5-alkyl that are optionally substituted with a substituent selected from the group consisting of halogen, C_1–C_5-alkoxy, C_1–C_5-alkyl-thio, C_1–C_5-alkyl-carboxy, and cyano;

R_3 and R_4 are independently selected from the group consisting of linear and branched C_1–C_5 alkyl, phenyl and benzyl, and optionally R_3 and R_4 form a C_5–C_8-cycloalkyl group with the carbon atom to which they are commonly linked;

R_5 is independently selected from the group consisting of C_1–C_5 linear and branched alkyl that are optionally substituted with a substituent selected from the group consisting of halogen, C_1–C_5-alkoxy, C_1–C_5-alkyl-thio, C_1–C_5-carboxy-alkyl and cyano group, phenyl, benzyl and allyl;

R_6 is independently selected from the group consisting of hydrogen, halogen, C_1–C_5-alkoxy, C_1–C_5-alkyl-thio, C_1–C_5-carboxy-alkyl, cyano, linear and branched C_1–C_5 alkyl that are optionally substituted with a substituent selected from the group consisting of halogen, C_1–C_5-alkoxy, C_1–C_5-alkyl-thio, C_1–C_5-carboxy-alkyl and cyano;

R_7 represents a hydrogen atom or

wherein R_8 and R_9 form a monocyclic or polycyclic structure having from 5 to 12 members with the nitrogen atom to which they are commonly linked, said cyclic structure optionally containing an additional heteroatom selected from the group consisting of oxygen and nitrogen; and

X represents a —CH— group or N;

wherein at least one of said photochromatic compounds defined by formula (I) in said photochromatic composition has an R_7 substituent which is hydrogen and at least one of said photochromatic compounds defined by formula (I) has an R_7 substituent wherein R_8 and R_9 in the group

are as defined herein above.

5,180,525

PROCESS FOR PRODUCING GRANULAR FIRE RETARDANT

Kazuyoshi Umeda, Mihara, and Funiaki Nakamoto, Onomichi, both of Japan, assignors to Teijin Chemicals, Ltd., Tokyo, Japan

PCT No. PCT/JP91/00174, § 371 Date Oct. 11, 1991, § 102(e) Date Oct. 11, 1991, PCT Pub. No. WO91/12295, PCT Pub. Date Aug. 22, 1991

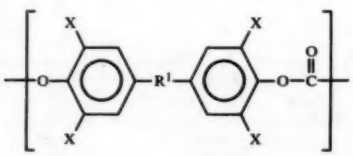
PCT Filed Feb. 14, 1991, Ser. No. 768,193

Claims priority, application Japan, Feb. 14, 1990, 2-33349

Int. Cl.[5] **C09K** *21/14, 21/08;* **C08K** *5/04, 5/41*

U.S. Cl. 252—609 **4 Claims**

1. A process for producing a granular fire retardant, characterized by melt-extruding a halogenated carbonate compound having at least one unit represented by the following general formula (i)



(i)

(X is a bromine atom or a chlorine atom, and R^1 is an alkylene group of 1-4 carbon atoms, an alkylidene group or $—SO_2—$) and having a specific viscosity of 0.015–0.10, by the use of an extruder and then immediately cutting the extrudate into granules.

5,180,526

CLEANING OF SOLUTIONS OF ALKYLPHOSPHATES

Stewart G. Holderness, Cheshire, United Kingdom, assignor to British Nuclear Fuels, plc, Warriington, England

Filed Sep. 30, 1991, Ser. No. 788,793

Claims priority, application United Kingdom, Sep. 29, 1990, 9021264

Int. Cl.[5] **G21F** *9/08*

U.S. Cl. 252—631 **23 Claims**

23. A process for cleaning a degraded tributylphosphate solution in a hydrophobic organic solvent, the solution being degraded in the solvent extraction of uranium from uranium ore and containing complexed nitric acid and complexed species comprising uranium therein, the process comprising,

a) washing the tributylphosphate counter-currently, initially with a weak solution comprising sodium carbonate, and then with aqueous sulfuric acid at a solvent to aqueous ratio of about b 2:1 to remove the complexed nitric aid and the complexed species, the concentration of the sulfuric acid being about 4% by volume, and the temperature during washing being between 18° C. and 25° C.

b) filtering the washed solution, and

c) contacting the filtered tributylphosphate solution with a macroreticular anionic styrene divinyl benzene copolymer ion exchange material arranged in a column for a contact time of between 01.1 and 1.0 bed-volumes per hour.

5,180,527

NUCLEAR FUEL PELLETS

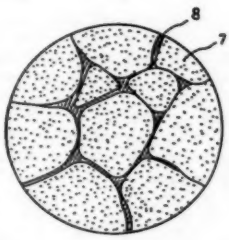
Mutsumi Hirai, Mito; Shinji Ishimoto, Orarai, and Kenichi Ito, Katsuta, all of Japan, assignors to Nippon Nuclear Fuel Development Co., Ltd., Ibaragi, Japan

Filed Mar. 25, 1991, Ser. No. 674,170

Claims priority, application Japan, Apr. 3, 1990, 2-87579; Nov. 5, 1990, 2-297082

Int. Cl.[5] **G21C** *3/00*

U.S. Cl. 252—638 **9 Claims**



1. Nuclear fuel pellets, consisting of:

sintered grains of nuclear fuel substance having a continuous deposition phase in the grain boundaries of said sintered grains, said deposition phase consisting of beryllium oxide alone or a mixture of beryllium oxide and at least one other oxide selected from the group consisting of titanium, gadolinium, calcium, barium, magnesium, strontium, lanthanum, yttrium, ytterbium, silicon, aluminum, samarium, tungsten, zirconium, lithium, molybdenum, uranium and thorium, wherein the amount of beryllium oxide alone is 13.6 wt. % at maximum or wherein the amount of a mixture of beryllium oxide and said other oxides is 12.5 wt. % at maximum.

5,180,528

APPARATUS AND METHOD FOR FLUID DISTRIBUTION IN A COOLING TOWER

Vladimir Kaplan, Silver Spring, Md., assignor to AMSTED Industries Inc., Chicago, Ill.

Filed Jul. 31, 1991, Ser. No. 738,444

Int. Cl.[5] **B01F** *3/04, 5/20*

U.S. Cl. 261—111 **15 Claims**

1. A fluid distribution system for a cooling tower providing cooling fluid to a heat exchange application, said fluid having its temperature reduced from an as-received temperature at a tower inlet fluid supply pipe, said tower having an enclosure, heat transfer media, and an exhaust fan, said system comprising:

a distribution pan having a pan bottom, a front side, a back side, a first end and a second end cooperating to define a

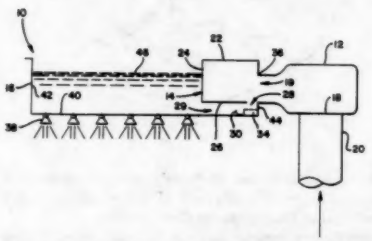
pan basin, said distribution pan positioned above said heat transfer media;

at least one flow metering nozzle positioned in said pan bottom for fluid transfer from said basin to said heat-transfer media;

a flume top, a flume side, and a flume bottom cooperating to define a flume for transport of cooling fluid and a flume connecting port, said flume having a longitudinal axis,

said flume bottom defining an opening for discharge of said fluid from said flume, which opening is generally parallel to said longitudinal axis;

an inlet having a chamber, a first opening and a second opening, one of said first and second openings coupled to



said supply pipe for transfer of spent cooling fluid at said as received temperature from said heat exchange application to said inlet chamber, which inlet is positioned along said pan back side in proximity to one of said pan first and second ends;

said flume mounted in said basin at said pan back side with said connecting port coupled to the other of said inlet first and second openings to provide fluid transfer from said inlet chamber to said flume, said flume operable to transfer and evenly distribute said as-received-temperature fluid through said flume opening to said basin to provide a substantially uniform static fluid pressure head to each of said at least one flow metering nozzles.

5,180,529

PROCESS FOR PRODUCING A THIN CARBON PLATE

Akira Takaku; Toshimasa Hashimoto, both of Tokyo; Toshio Suzuki; Yutaka Takahashi, both of Saitama, and Kazuo Saito, Tokyo, all of Japan, assignors to Nisshinbo Industries, Inc., Tokyo, Japan

Filed Feb. 20, 1991, Ser. No. 659,214

Claims priority, application Japan, Feb. 21, 1990, 2-40587

Int. Cl.[5] C01B *31/02*

U.S. Cl. 264—29.6 **11 Claims**

1. A process for producing a thin carbon plate, which comprises molding a polycarbodiimide resin into a thin plate, subjecting the thin plate to a heat treatment, and carbonizing the heat-treated thin plate.

5,180,530

VELOCITY PROFILE FOR CLAMP LOCKOVER

Dennis J. Cropper, Georgetown; James E. O'Bryan, Cincinnati, and Susan Waits, Hillsboro, all of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed May 28, 1991, Ser. No. 705,831

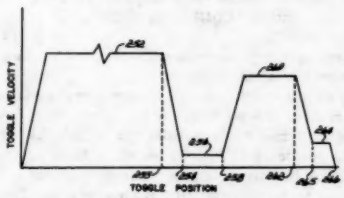
Int. Cl.[5] B29C *45/80*

U.S. Cl. 264—40.5 **5 Claims**

1. A method effected prior to injecting molten plastic material into a mold for controlling motion of a toggle mechanism coupled to a first mold element on a molding machine, said toggle mechanism being operative to move from an open position at which the first mold element is separated from a second mold element to a locked position at which the mold elements are in contact, the method comprising the steps of:

a. moving the toggle mechanism from the open position at a rapid velocity;

b. decelerating the toggle mechanism to a second velocity less than the rapid velocity in response to the first mold element being a predetermined distance from contact with the second mold element;



c. accelerating the toggle mechanism to a third velocity greater than the second velocity in response to the first mold element being in contact with the second mold element; and

d. decelerating the toggle mechanism to a velocity approximately equal to the second velocity in response to the toggle mechanism being a predetermined distance from the locked position.

5,180,531

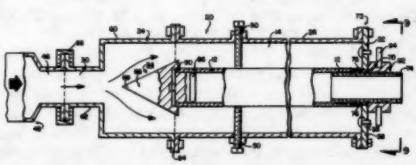
METHOD OF FORMING PLASTIC PILING

Vartkes Borzakian, 433 Ross St., Glendale, Calif. 91207

Continuation-in-part of Ser. No. 407,574, Sep. 15, 1989, Pat. No. 5,051,385, and a continuation-in-part of Ser. No. 226,138, Jul. 29, 1988, abandoned. This application Sep. 17, 1990, Ser. No. 583,446

Int. Cl.[5] B29C *67/22*

U.S. Cl. 264—45.3 **11 Claims**



1. A method for forming a plastic member having an outer diameter of at least 10 inches, the member being suitable for use as a plastic piling, the method comprising the steps of:

(a) supporting an elongated core at least 10 feet long and at least 3 inches in diameter inside a mold;

(b) forming a substantially homogeneous plastic composition comprising low-density polyethylene, high-density polyethylene, polypropylene, foaming agent, and an antioxidant;

(c) extruding the substantially homogeneous plastic composition into the mold and directly onto and around the core with the foaming agent releasing gas so that the mold is filled and the core is substantially completely embedded in foamed extruded plastic, the thickness of the plastic being at least 2 inches;

(d) allowing the foamed extruded plastic to cool around the core to form the plastic member comprising the plastic and the core completely embedded in the plastic; and

(e) removing the cooled plastic member from the mold; wherein the plastic composition comprises, based on the weight of the plastic components of the coating, from about 20% to about 50% by weight low density polyethylene, from about 20% to about 50% by weight high density polyethylene, and from about 35% to about 55% by weight polypropylene.

5,180,532

PROCESS FOR PREPARING MICA-CONTAINING CERAMIC COMPOSITE

Tadaki Murakami; Takashi Shirazawa, and Kazuharu Kato, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 8, 1990, Ser. No. 461,911
Claims priority, application Japan, Feb. 27, 1989, 1-47525
Int. Cl.[5] C04B *35/71*; B28D *1/32*
U.S. Cl. 264—60 **11 Claims**

1. A process for preparing a mica-containing ceramic composite, which comprises steps of:

a) preparing a powder mixture by blending materials consisting of 20 to 50% by weight of mica powder, 15 to 40% by weight of zinc oxide powder, 10 to 20% by weight of silica powder, 8 to 20% by weight of boric acid powder, and 4 to 20% by weight of cordierite powder;

b) heating said powder mixture at a temperature of from 940° C. to 1,050° C. to prepare a baked product;

c) pulverizing said baked product into very fine powder to thereby obtain a shaping material;

d) adding an organic binder to said shaping material to prepare a shaping composition; and

e) shaping said shaping composition into a shaped body and heating said shaped body at a temperature ranging from 940° C. to 1,050° C. with simultaneous application of pressure to said shaped body to render the same into a baked body.

5,180,533

METHOD FOR PRODUCTION OF SINTERED CERAMIC ARTICLE CONTAINING TITANIUM DIBORIDE AND SILICON CARBIDE

Akira Kamiya, Nagoya, and Kikuo Nakano, Kasugai, both of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Sep. 19, 1991, Ser. No. 762,376
Claims priority, application Japan, Sep. 21, 1990, 2-253531
Int. Cl.[5] F27D *7/00*; C04B *35/58*
U.S. Cl. 264—65 **10 Claims**

1. A method for the production of a high-strength sintered ceramic article having a matrix of titanium diboride and a dispersed reinforcing phase of silicon carbide and containing boron carbide and silicon, by heating and pressing, which method consists essentially of mixing titanium diboride powder and at least one silicon carbide selected from the group consisting of silicon carbide whiskers and silicon carbide powder in an amount in the range of from 5 to 30% by volume, based on the total amount of titanium diboride and silicon carbide, combining the resultant mixture with 1 to 10% by weight, based on the amount of said resultant mixture, of silicon boride and sintering the resultant combination in a non-oxidative atmosphere under a pressure of at least 300 kg/cm^2 at a temperature of at least 1,300° C.

5,180,534

PROCESS OF MANUFACTURING A REFASTENABLE MECHANICAL FASTENING SYSTEM

Dennis A. Thomas, Cincinnati; David J. K. Goulait, West Chester, and Robert G. Cox, Jr., Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 21, 1990, Ser. No. 632,283
Int. Cl.[5] B29C *53/00*
U.S. Cl. 264—145 **16 Claims**

1. A method for manufacturing a fastening material having prongs, the method comprising the steps of:

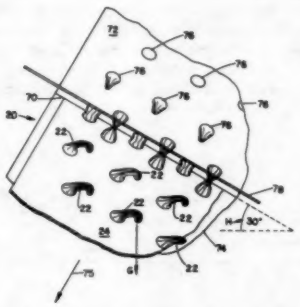
providing a thermally sensitive material;

heating said thermally sensitive material to at least the melting point;

providing a substrate transported in a first direction;

depositing discrete amounts of said thermally sensitive material on said transported substrate;

stretching said discrete amounts of thermally sensitive material in a direction having a vector component parallel to the plane of said substrate;



severing said stretched thermally sensitive material to form prongs having shanks, each of said shanks having a distal end and engaging means thereon; and

imparting an azimuthal angle of between about 20 degrees to about 160 degrees to said shanks of said prongs.

5,180,535

INJECTION MOLDING OF STYRENE RESIN

Ikuro Yamaoka, and Masao Kimura, both of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 20, 1990, Ser. No. 481,597
Int. Cl.[5] B29B *11/08*; B29K *9/06*; B29C *45/73*
U.S. Cl. 264—328.16 **5 Claims**

1. A method of injection molding a styrene resin or a composition thereof, which comprises injection molding a molten molding resin material of a styrene-conjugated diene block copolymer containing 50% to 90% by weight of a styrene polymer or a molten molding resin material of a resin composition comprising 50% by weight or more of said styrene-conjugate diene block copolymer and 50% by weight or less of a styrene resin other than said styrene-conjugated diene block copolymer, wherein the injection molding is carried out at a barrel temperature of 180° to 250° C., and wherein said molten resin is injected and filled into a mold with a wall surface temperature of 110° C. to 180° C. at core and cavity portions within the mold, and the resin is cooled at a speed of not lower then 0.3° C./sec. after being filled into the mold, and the molded product is demolded when the wall surface temperature of the core and cavity portions is lowered to the glass transition temperature or lower of the styrene polymer moiety in said block copolymer or a temperature of not higher then 90° C.

5,180,536

METHOD AND APPARATUS FOR INSERTING A POURING PIPE INTO A MOLD OF A CONTINUOUS CASTING MACHINE

Raimund Bruckner, Engenhahn; Peter Keutgen, Kreuzau, and Andreas Donner, Aachen, all of Fed. Rep. of Germany, assignors to Didier-Weke AG, Wiesbaden, Fed. Rep. of Germany

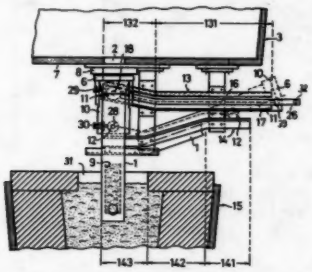
Filed Jul. 17, 1991, Ser. No. 731,278
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1990, 4023077
Int. Cl.[5] B22D *41/56*
U.S. Cl. 266—44 **40 Claims**

1. A method of inserting a pouring pipe into a mold of a continuous casting machine and beneath a casting opening of a metallurgical vessel, comprising the steps of:

providing a conveyor in a region adjacent an upper opening of the mold;

mounting the pouring pipe on the conveyor in a substantially horizontal starting position outside of the mold;

transporting the pouring pipe along said conveyor from said substantially horizontal starting position to a substantially vertical waiting position wherein a lower end of the pouring pipe is inserted through the upper opening of the mold, and an upper end of the pouring pipe is offset from but substantially aligned with the casting opening of the metallurgical vessel, such that the pouring pipe in the waiting position can be subsequently pushed into a substantially vertical pouring position wherein the upper end



of the pouring pipe is directly beneath the casting opening in the metallurgical vessel and the lower end of the pouring pipe remains inserted through the upper opening of the mold;

moving the pouring pipe from the substantially vertical waiting position into the substantially vertical pouring position;

wherein the pouring pipe has a head plate disposed at an upper end thereof, and a guide plate is disposed at a bottom wall of the metallurgical vessel; and

wherein said step of moving the pouring pipe comprises actuating a pushing mechanism to push the pouring pipe such that the head plate of the pouring pipe is moved along the guide plate of the metallurgical vessel.

5,180,537

METHOD OF CONTINUOUSLY CASTING A LIQUID METAL USING STREAM PROTECTION TUBE

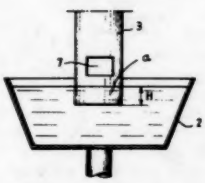
Jean-Paul Grand, Miramas; Daniel Juvigny, Pelissanne; André Vinuesa, Mallemort, and Serge Tortosa, Martigues, all of France, assignors to Sollac, Puteaux, France

Filed Aug. 29, 1991, Ser. No. 751,831

Claims priority, application France, Aug. 30, 1990, 90 10829

Int. Cl.[5] B22D *41/50*

U.S. Cl. 266—45 **3 Claims**



1. A method of continuously casting a liquid metal comprising the steps of:

providing an upper vessel and a lower vessel;

providing a stream protection tube disposed between said upper vessel and said lower vessel, said stream protection tube being connected at an upper end thereof to a tap hole defined in a bottom portion of said upper vessel, said stream protection tube being open at a lower end thereof, at least one aperture being defined in a wall of said tube near said lower end;

disposing said upper vessel above said lower vessel;

lowering said upper vessel until a lower portion of said tube disposed below said at least one aperture is immersed in liquid metal contained in said lower vessel, said at least one aperture being disposed above said liquid metal,

opening said tap hole so that liquid metal disposed in said upper vessel flows into said stream protection tube, air contained in said tube being expelled through said at least one aperture;

lowering said stream protection tube into said lower vessel until said at least one aperture is completely immersed in said liquid metal contained in said lower vessel; and

continuing casting of metal from said upper vessel to said lower vessel.

5,180,538

DEVICE AND METHOD FOR FEEDING MOLTEN METAL FOR THE PRESSURE CASTING OF METAL PRODUCTS

Robert A. Vatant, Saint-Chamond; Michel F. Courbier, Le Breuil, and André Weiss, Saint-Chamond, all of France, assignors to Creusot-Loire Industrie, Puteaux and Clecim, Pontoise, both of, France

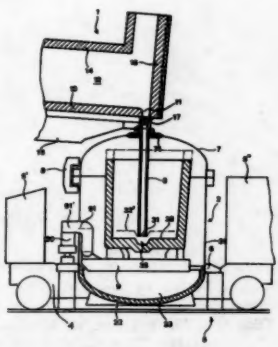
PCT No. PCT/FR90/00033, § 371 Date Sep. 10, 1991, § 102(e) Date Sep. 10, 1991, PCT Pub. No. WO90/08002, PCT Pub. Date Jul. 26, 1990

PCT Filed Jan. 16, 1990, Ser. No. 720,780

Claims priority, application France, Jan. 16, 1989, 89 00840

Int. Cl.[5] B22D *41/00*

U.S. Cl. 266—91 **16 Claims**



1. Device for feeding molten metal to a mould of a pressure-casting installation, comprising a vessel equipped with a cover carrying a spout, the said vessel resting on a frame and comprising a framework for supporting a ladle of molten metal, means for weighing the said ladle, and means for raising the said framework relative to the said vessel.

5,180,539

METHOD OF AND APPARATUS FOR PRODUCING METAL POWDER

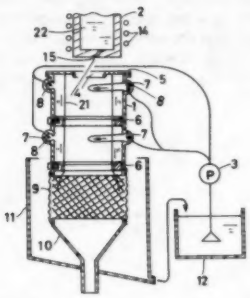
Syoichi Yoshino; Hiroshi Izaki; Masanori Yoshino; Fumio Kasai; Yosimitu Tokunaga, all of Osaka, and Naotsugu Isshiki, Tokyo, all of Japan, assignors to Kubota Corporation, Osaka, Japan

Filed Mar. 20, 1991, Ser. No. 672,576

Claims priority, application Japan, Mar. 20, 1990, 2-70732; May 10, 1990, 2-121962

Int. Cl.[5] C22B *9/05*

U.S. Cl. 266—202 **15 Claims**



10. An apparatus for producing a metal power characterized in that the apparatus comprises:

a hollow cylindrical cooling tubular body provided with a liquid injection pipe for injecting a cooling liquid onto an inner circumference of the tubular body in a direction tangential to the inner circumference;

injector means for injecting a molten metal into a cooling liquid layer formed over the inner circumferential surface of the tubular body by the cooling liquid injected from the liquid injection pipe;

feed means for feeding the cooling liquid to the liquid injection pipe; and

a ring for adjusting the thickness of the cooling liquid layer, said ring being provided on the inner periphery of the cooling tubular body.

5,180,540

FUEL ROD CONSOLIDATION STRUCTURE

Thomas J. Smentek, Forest, Va., assignor to B&W Fuel Company, Lynchburg, Va.

Filed Mar. 25, 1991, Ser. No. 674,014

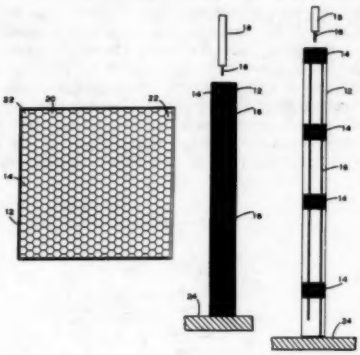
Int. Cl.[5] G21C *19/00*; G21F *5/008*

U.S. Cl. 376—261 **7 Claims**

1. A fuel rod consolidation structure, comprising:

a. a storage canister;

b. a grid structure that is attached to and extends downwardly from the top of said canister along a portion of the interior of said storage canister whereby said grid structure provides radial support to fuel rods loaded in said canister; and



c. said grid structure having a plurality of individual cells positioned in a triangular pitch array with each cell sized to receive one nuclear fuel rod.

5,180,541

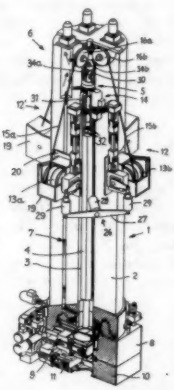
HANDLING FLASK COMPRISING A DEVICE FOR DISPLACEMENT OF A LOAD ALONG A VERTICAL AXIS

Nicolas De Seroux, and Dominique Limouzin, both of Lyon, France, assignors to Framatome, Courbevoie, France

Filed Apr. 10, 1991, Ser. No. 683,188

Int. Cl.[5] G21C *19/10*

U.S. Cl. 376—271 **10 Claims**



1. A handling flask for handling a load, comprising a hollow body having a vertical channel in a central part of said hollow body and a device for vertical displacement of said load along an axis of said channel, comprising at least two sets of two drums which are driven by two motor means and on which are wound two cables for suspension and displacement of a grab movable in said channel and in an axial extension of said channel and comprising attachment means for said load and a support equipped with pulleys over which said cables pass, wherein each of said sets of two drums driven by a motor means and constituting a winch is fastened to an outer surface of said hollow body, in such a way that said drums of each said winch are each located opposite one of said drums of the other said winch in relation to the vertical axis of said channel, said

device for vertical displacement of said load further comprising

(a) a first cable having ends wound on a first and a second drum situated at opposite locations on said hollow body and, on a run of said cable between said first and second drums, on a set of deflecting pulleys and at least one pulley mounted on said support for supporting said grab; and

(b) a second cable having ends wound on a third and a fourth drum situated at opposite locations on said hollow body and, on a run of said cable between said third and fourth drums, on a set of deflecting pulleys and at least one pulley mounted on said support for supporting said grab.

5,180,542

CONTAINER

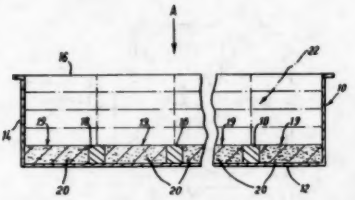
David J. Brown, Hamworthy, United Kingdom, assignor to British Nuclear Fuels plc, Warrington, England

Filed Dec. 18, 1991, Ser. No. 809,342

Claims priority, application United Kingdom, Nov. 2, 1991, 9123282

Int. Cl.[5] G21C *19/00*

U.S. Cl. 376—272 **13 Claims**



1. A container for material contaminated with a toxic substance or a radionuclide, wherein the improvement comprises, the container having a base, intersecting members at the base inside the container define a plurality of recesses therebetween, and absorbent cementitious material disposed in the recesses for absorbing liquid in the container.

5,180,543

PASSIVE SAFETY INJECTION SYSTEM USING BORATED WATER

Lawrence E. Conway, Allegheny, and Terry L. Schulz, Westmoreland, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 26, 1989, Ser. No. 371,299

Int. Cl.[5] G21C *15/18*

U.S. Cl. 376—282 **9 Claims**

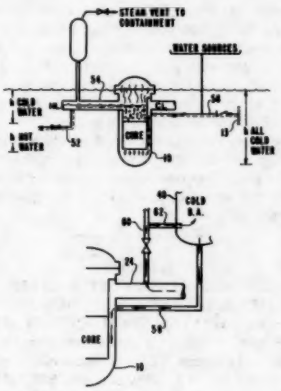
1. A passive injection system for a nuclear power plant including a containment, a reactor vessel having a core, a hot leg in communication with the core, a cold leg, and a borated water supply for injecting into the reactor core during a loss of coolant accident in which the containment is flooded, comprising:

a first flow path extending from the hot leg at a point below the flood up level of water in the containment, and providing a passageway from the hot leg to the containment; and

a second flow path extending from the reactor vessel and providing a passageway from the containment to the reactor core;

the first and second flow paths providing means for inducing a natural circulatory flow of water from within the containment through the reactor core based on differences in water density produced by the reactor core to thereby prevent concentration of boron in the reactor vessel,

wherein the first flow path is coupled to a bottom of the hot leg so that steam can vent through an upper portion of the pipe, and wherein the first flow path is coupled to the hot leg at an elevation at the top of the reactor core and below the flood up water level in the containment thus establishing a circulatory flow of water from the containment through the core based on differences in water density.



5,180,544

CONTROL BLADE FOR NUCLEAR REACTOR

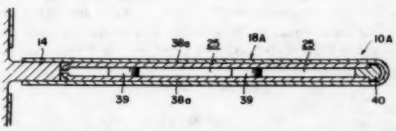
Ritsuo Yoshioka; Makoto Ueda, both of Yokohama; Yuichi Motora, Tokyo, and Mitsuharu Nakamura, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 419,540, Oct. 10, 1989, abandoned, which is a continuation of Ser. No. 68,190, Jun. 30, 1987, Pat. No. 4,876,060. This application Aug. 21, 1991, Ser. No. 752,218

Claims priority, application Japan, Jun. 30, 1986, 61-151567; Feb. 12, 1987, 62-28339; Feb. 12, 1987, 62-28340; Mar. 4, 1987, 62-47677; Mar. 10, 1987, 62-54986; Mar. 31, 1987, 62-78171

Int. Cl.[5] G21C *7/10*

U.S. Cl. 376—333 **1 Claim**



1. A control blade for use in nuclear reactors comprising:

an upper structure means provided with a handle for handling of the control blade;

a lower structure means provided with a speed limiter;

a central tie rod means for connecting integrally said upper and lower structure means together, having radial projections so as to exhibit a substantially cross-shaped cross section;

a sheath plate means having a substantially U-shaped cross-section and secured to the end of each projection of said central tie rod means;

a hafnium neutron absorber means disposed in each sheath plate means and divided into a plurality of neutron absorber elements along the axis of said central tie rod means, each neutron absorber element being composed of a pair of substantially parallel adjacent neutron absorber plates or sheets spaced from and opposing each other so that a space is defined therebetween and an end tie rod means provided between outer facing end portions of the respective neutron absorber plates so as to close an outer end opening of the space, said end tie rod means being disposed for effectively increasing reactivity, each of said

neutron absorber plates being provided with an inner facing end adjacent to said central tie rod, said inner facing ends of each pair of adjacent neutron absorber plates being curved to approach each other and said inner facing ends are spaced from each other so that thermal expansion of the neutron absorber plates is absorbed, the respective adjacent ones of said neutron absorber elements being arranged with gaps therebetween in the axial direction of said central tie rod means so that axial ends of the absorber elements of adjacent neutron absorber plates occupy different horizontal planes; and

supporting spacer means provided inbetween said adjacent opposing neutron absorber plates at a predetermined interval in the axial direction of said central tie rod means so as to define the space as a water gap for guiding flow of a moderator.

5,180,545

LOWER END NOZZLE OF A FUEL ASSEMBLY HAVING A PARTICLE RETENTION DEVICE AND FUEL ASSEMBLY HAVING SUCH AN END NOZZLE

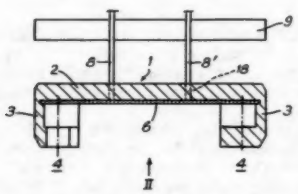
Bernard Grattier, Dardilly, France, assignor to Framatome, Courbevoie and Cogema, Velizy Villacoublay, both of, France

Filed Apr. 12, 1990, Ser. No. 508,583

Claims priority, application France, Apr. 12, 1989, 89 04840

Int. Cl.[5] G21C *1/04*

U.S. Cl. 376—352 **19 Claims**



1. A lower end nozzle of a nuclear fuel assembly, comprising an adaptor plate (**2**, **2'**, **2''**) having water passage holes and a bottom face, supporting feet (**3**, **12**, **15**) and a device for the retention of particles contained in the coolant flow of the reactor, in which the retention device (**6**, **11**, **16**, **30**, **46**) consists of a filter plate pierced with filtration holes having a smaller size than said water passage holes and being fastened against the bottom face of the adaptor plate over a substantial part of its surface.

5,180,546

BOILING WATER REACTOR WITH DOWNCOMER STEAM RELEASE CHANNEL

Rudolf M. Van Kuijk, Cupertino, Calif., assignor to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 611,320, Nov. 13, 1990, abandoned, which is a continuation of Ser. No. 408,003, Sep. 15, 1989, abandoned. This application Oct. 17, 1991, Ser. No. 777,465

Int. Cl.[5] G21C *15/00, 15/16*

U.S. Cl. 376—371 **2 Claims**

1. A reactor system comprising: conversion means for converting kinetic energy of vapor flow into another form of energy; and

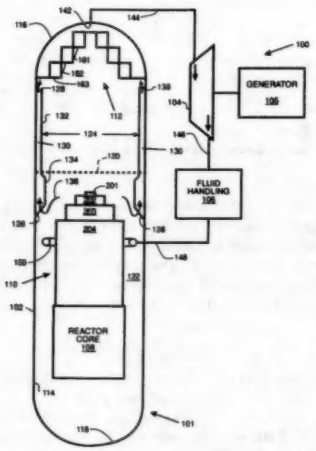
a natural-circulation reactor relying on free-surface separation to extract a vapor phase, and said reactor including

a reactor vessel for containing a heat-transfer fluid having a liquid phase and a vapor phase, said vessel having a vapor exit for outputting vapor generated within said vessel, said vessel having a liquid input for inputting liquid into said vessel, said vessel having a nominal liquid level,

a reactor core for generating heat, said core being disposed within said vessel, said core being adapted for converting liquid flowing therethrough to vapor, said core having a bottommost core extent and a top most extent,

a chimney disposed within said vessel, said chimney extending from said core to a level below said nominal liquid level, said chimney having structural section means defining vertically extending sections, each of said sections extending vertically from said core to a level below said nominal liquid level, each of said sections radially confining fluid flowing therethrough, said section defining a radially extending array, said array including at least first and second groups of said sections, said first group including at least one of said sections, said structural section means dividing said second group into plural substantially equal sections arranged annularly about said first group so that each of said sections in said second group is in contact with two other sections of said second group, the sections of said first group having a first average height, the sections of said second group having a second average height which is less than said first average height,

a downcomer providing a return path for fluid exiting said chimney to return to said core, said downcomer extending at least from said first average height at least to said bottommost core extent, said downcomer extending radially from said core and said chimney to said sidewall, and



channel means for evacuating vapor from said downcomer generally upward and along said sidewall, said channel means being disposed within said vessel and adjacent to said sidewall, said channel means having at least one entrance with a mean entrance height between said first average height and said second average height, said channel means having exits only in the space above said liquid level, said channel means having a lowest extent above said liquid input and above said topmost extent of said core;

transfer means for transferring vapor from said vapor exit to said conversion means, said transfer means being in fluid communication with said vapor exit and said conversion means; and

replenishment means for supplying a liquid to replace fluid transferred to said conversion means so as to maintain a relatively constant liquid level within said vessel, said replenishment means being in fluid communication with said vessel through said liquid input.

5,180,547

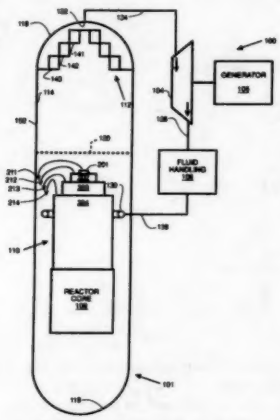
BOILING WATER REACTOR WITH STAGGERED CHIMNEY

Rudolf M. Van Kuijk, Cupertino, Calif., assignor to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 701,645, May 15, 1991, abandoned, which is a continuation of Ser. No. 325,839, Mar. 20, 1989, abandoned. This application Oct. 15, 1991, Ser. No. 776,727

Int. Cl.[5] G21C *15/00, 15/16*

U.S. Cl. 376—377 2 Claims



1. A reactor system comprising:

conversion means for converting kinetic energy of vapor flow into another form of energy; and

a natural-convection boiling-water reactor employing free-surface steam separation, said reactor including:

a reactor vessel having a vapor exit for outputting vapor generated within said vessel, said vessel having a liquid input for inputting liquid into said vessel, said vessel having a nominal liquid level;

transfer means for transferring heated fluid from said vessel to said conversion means, said transfer means being in fluid communication with said vapor exit;

replenishment means for supplying a liquid to replace fluid transferred from said vessel to said conversion means so as to maintain a relatively constant liquid level at said nominal liquid level within said vessel, said replenishment means being in fluid communication with said vessel through said liquid input;

a reactor core for generating heat, said core being disposed within said vessel below said nominal liquid level, said core being adapted for converting liquid flowing therethrough to vapor; and

a chimney disposed within said vessel, said chimney extending from said core to a level below said nominal liquid level, said chimney having structural section means defining vertically extending sections, each of said sections extending vertically from said core to a level below said nominal liquid level, each of said sections radially confining fluid flowing therethrough, said sections defining a radially extending array, said array including at least first and second groups of said sections, said first group including at least one of said sections, said structural section means dividing said second group into plural substantially equal sections arranged annularly about said first group so that each of said sections in said second group is in contact with two other sections of said second group, the sections of said first group having a first average height, the sections of said second group having a second average height which is less than said first average height.

5,180,548

GRID HAVING MIXING FINS FOR A NUCLEAR FUEL ASSEMBLY

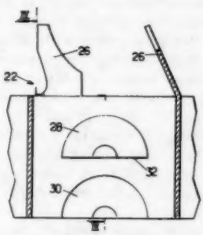
Michel Verdier, Villeurbanne, France, assignor to Framatome, Courbevoie and Compagnie Generale Des Matieres Nucleaires, Villacoublay, both of, France

Filed Jul. 24, 1991, Ser. No. 735,246

Claims priority, application France, Jul. 24, 1990, 90 09446

Int. Cl.[5] G21C *3/34*

U.S. Cl. 376—439 10 Claims



1. A mixing grid for a nuclear fuel assembly, the grid comprising at least two sets of crossed plates fixed together at their cross-points and defining cells distributed in a regular array, some for receiving fuel rods and the others for receiving guide tubes, the plates being provided with coolant stirring fins extending the plates downstream and disposed to deflect the coolant transversely to its general flow direction, each plate being provided with abutment means projecting inwardly from each of the sides of those cells which are to receive fuel rods, thereby defining a passage that is larger than the size of the rods but small enough to prevent a rod contained in the cell coming into contact with the fins, wherein said abutment means comprise, in each plate separating two cells other than peripheral which receives a rod, two portions of said plate that are cut out and deformed into two scoops, and that are mutually offset in the coolant flow direction, said scoops projecting in mutually opposite directions and tending to cause coolant to pass from one cell to another across said plate.

5,180,549

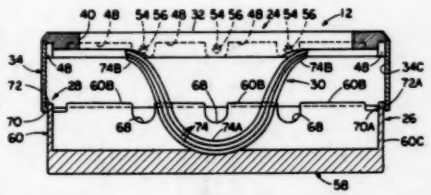
NUCLEAR FUEL ASSEMBLY HAVING DOUBLE ENCLOSURE TOP NOZZLE SUBASSEMBLY

James A. Sparrow, Columbia, and Robert W. Cantrell, Hopkins, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 26, 1991, Ser. No. 736,359

Int. Cl.[5] G21C *3/32*

U.S. Cl. 376—445 22 Claims



1. A double enclosure top nozzle subassembly for a nuclear fuel assembly, said top nozzle subassembly comprising:

(a) an upper structure including a top plate and an outer sidewall enclosure rigidly connected to and depending from an outer peripheral edge of said top plate;

(b) a lower structure including a lower adaptor plate and an inner sidewall enclosure rigidly connected to and upstand-

ing from an outer peripheral edge of said lower plate, said lower adapter plate being disposed below said top plate, said inner sidewall enclosure being disposed within said outer sidewall enclosure, said inner and outer sidewall enclosures being movable in sliding contacting relationship relative to one another so as to permit movement of said top plate toward and away from said lower adapter plate;

(c) interengaging means on respective upper and lower peripheral edges of said inner and outer sidewall enclosures for defining stops which limit the movement of said top plate and lower adaptor plate away from each other so as to retain said outer and inner sidewall enclosures in said sliding contacting relationship with one another and prevent movement of said lower peripheral edge of said outer sidewall enclosure below said lower adaptor plate, said interengaging means on said respective upper and lower peripheral edges of said inner and outer sidewall enclosures also defining sliding surfaces between said inner and outer sidewall enclosures being maintained in continuous contact with one another as said top plate and lower adapter plate move toward and away from one another; and

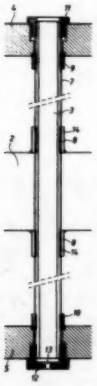
(d) a plurality of resiliently-yieldable biasing devices disposed within said inner and outer sidewall enclosures and extending between and engaging said top plate and said lower adapter plate, said devices being movable between compressed and expanded states in response respectively to application and removal of a hold-down force on said upper structure in the direction of said lower structure for respectively permitting and causing movement of said inner and outer sidewall enclosures relative to one another and said top plate toward and away from said lower adapter plate and thereby said top nozzle subassembly between compressed and expanded conditions.

5,180,550

FUEL ASSEMBLY FOR NUCLEAR REACTOR

Olov Nylund, Västerås, Sweden, assignor to ABB Atom AB, Västerås, Sweden

Filed May 16, 1991, Ser. No. 700,807
Claims priority, application Sweden, May 22, 1990, 9001839
Int. Cl.[5] G21C *3/32*
U.S. Cl. 376—449 **9 Claims**



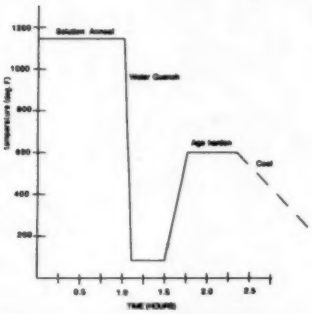
1. A fuel assembly for a nuclear reactor, comprising a number of parallel fuel rods which are retained by means of spacers arranged along the fuel rods and guide tubes arranged between the fuel rods, the guide tubes being fixed to the spacers, a top nozzle and a bottom nozzle between which the guide tubes with the associated fuel rods are fixed, and wherein the guide tubes, at least adjacent said spacers, are provided with external threads in order to fix the spacers to the guide tubes.

5,180,551

GOLD ALLOYS OF EXCEPTIONAL YELLOW COLOR AND REVERSIBLE HARDNESS

Dwarika P. Agarwal, Attleborough, Mass., assignor to Leach & Garner Co., N. Attleboro, Mass.

Filed Oct. 30, 1991, Ser. No. 784,766
Int. Cl.[5] C22C *5/02*
U.S. Cl. 420—511 **2 Claims**



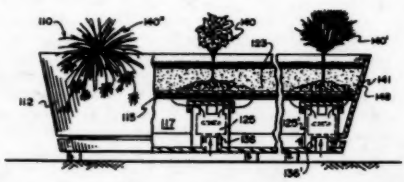
1. A gold based alloy composition comprising:
not less than about 58.03 weight percent gold;
not less than about 10.0 weight percent silver;
not less than about 2.0 weight percent zinc;
not less than about 0.2 weight percent cobalt;
copper in weight percent amount equal to 100 less the sum total of the weight percent of said gold, silver, zinc and cobalt;
a ratio of said copper amount to said silver amount being between about 2.0 and about 3.8; and
a ratio of said copper amount to, sum total of said silver amount plus twice said zinc amount, being between about 1.3 and about 2.5.

5,180,552

ROOM AIR PURIFICATION

Don F. Saceman, Tampa, Fla., assignor to Affiliated Innovation Management, Inc., Tampa, Fla.

Division of Ser. No. 185,588, Apr. 22, 1980, Pat. No. 4,975,251.
This application Aug. 10, 1990, Ser. No. 565,284
The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.
Int. Cl.[5] A61L *9/00*
U.S. Cl. 422—1 **13 Claims**



10. Method of removing contaminants from room air by moving the air along a path containing, an air-treating region having one or more plants and bounded in part laterally by air-impermeable means and supported in part horizontally by air-permeable means and in part by saucer means thereby adapted to retain in the airflow path air-permeable potting medium containing the plant roots.

5,180,553

PROCESS TO DESTROY BACTERIA

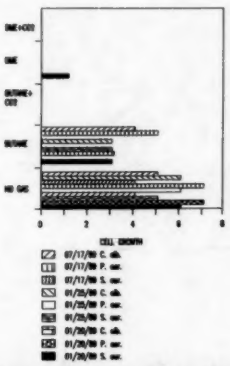
Joachim Singer, and Jurgen Singer, both of Ziegeleistrasse 2-6, 6901 Mauer, Fed. Rep. of Germany

Continuation of Ser. No. 435,000, Nov. 12, 1989, abandoned. This application Mar. 7, 1991, Ser. No. 666,507

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1988, 3838448

Int. Cl.[5] A61L *2/20*

U.S. Cl. 422—28 14 Claims



1. A process for preserving cosmetic, medicinal and pharmaceutical preparations by destroying cells, cellular products, infectious particles and similar pathogens contained therein, comprising filling a preparation into a pressure container equipped with a valve, and filling said pressure container with a gas compound or mixture consisting of butane, dimethylether and carbon dioxide, or butane and carbon dioxide in an amount effective to preserve the preparation.

5,180,554

METHOD OF DETECTING THE PRESENCE OF MOISTURE IN A GAS

Toru Yamaguchi, Sakura; Yukio Inazuki, Sayama, and Hideo Nakazawa, Funabashi, all of Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Division of Ser. No. 384,232, Jul. 24, 1989, abandoned. This application Jul. 29, 1991, Ser. No. 737,121

Claims priority, application Japan, Jul. 25, 1988, 63-183672; Aug. 2, 1988, 63-192037; Aug. 2, 1988, 63-192038

Int. Cl.[5] G01J *1/48*

U.S. Cl. 422—86 3 Claims

1. A method of detecting presence of moisture in a gas, comprising the steps of:

providing a transparent cylinder;

placing black barium metal in the cylinder;

providing gas permeable members at ends of the cylinder; and

supplying the gas into the cylinder through the gas permeable members such that the gas contacts the barium, whereby the presence of moisture is detected as the black color of the barium bleaches.

5,180,555

MICROBIOLOGICAL ANALYSIS CUP OR THE LIKE

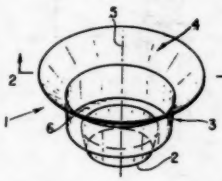
Daniel Monget, Lagnieu, France, assignor to Bio Merieux, Marcy l'Etoile, France

Continuation of Ser. No. 313,195, Feb. 16, 1989, abandoned. This application Oct. 25, 1990, Ser. No. 602,895

Claims priority, application France, Feb. 16, 1988, 88 02180

Int. Cl.[5] G01N *21/03*

U.S. Cl. 422—102 5 Claims



1. A microbiological cup for optical sensing, said cup including a reactive medium, said cup further including means to receive a quantity of an aqueous suspension of a microorganism, said cup having a flat bottom, a wall having a circular cross-section and an open top having an upper diameter, the improvement comprising:

the wall of said cup comprises three superimposed tapered zones, said tapered zones having respective different inclinations, said three tapered zones including a first lower tapered zone, a second higher tapered zone, and a third top tapered zone which extends to the open top of said cup, wherein base diameters of each of said three tapered zones increase from the flat bottom to the open top of said cup;

said first tapered zone extends from the flat bottom of said cup and an upper end thereof is connected to a lower end of said second tapered zone by an annular rim lying in a plane parallel to the plane of said flat bottom;

said second tapered zone extends from said annular rim and an upper end thereof is connected at an angle to a lower end of said third tapered zone, wherein the angle is constructed so as to restrict the rise of liquid sample therein due to capillary action.

5,180,556

MEANS OF MEASURING THE RATE AND CHARACTER OF HYDROCARBON GENERATION FROM SOURCE ROCKS USING HYDROUS PYROLYSIS

David G. Nolte; Helen K. Haskin, both of Houston, and Edwin L. Colling, Jr., Sugar Land, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 455,112, Dec. 22, 1989, Pat. No. 5,082,787. This application Aug. 6, 1991, Ser. No. 740,744

Int. Cl.[5] B01A *53/04;* G01N *5/00, 7/08*

U.S. Cl. 422—109 11 Claims

1. An apparatus for performing hydrous pyrolysis on a sample of hydrocarbon source material for studying the kinetic parameters of hydrocarbon generating from said source material comprising:

a reactor vessel having a chamber closed by sealing means;

a sample holder constructed so as to confine kerogen or oil shale sample within said chamber of said reactor vessel;

means for controlling the temperature in said chamber,

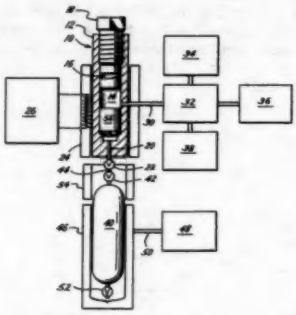
means for purging said chamber of oxygen;

means for injecting measured amounts of water into said chamber;

means for draining fluids from said chamber;

transfer vessel means constructed so as to be in flow communication with said chamber drain means so as to drain fluids form said chamber into said transfer vessel means;

cryogenic means for controlling the temperature of said transfer vessel means; and



dryer means adapted to receive fluids from said transfer vessel means and remove water therefrom.

5,180,557

FILTRATION SYSTEM WITH APPARATUS FOR ALTERING MAGNETIC PROPERTIES OF PARTICLES

Joseph B. Priestley, Jr., 13200 North 103rd Ave., Ste. 35, Sun City, Ariz. 85351

Continuation-in-part of Ser. No. 180,198, Apr. 11, 1988, Pat. No. 4,863,703. This application Jul. 28, 1989, Ser. No. 386,199
The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.
Int. Cl.[5] F27B *17/10*
U.S. Cl. 422—139 2 Claims

1. Particle treatment apparatus including

(a) means for forming in a volume of fluid a funnel having an upper portion, a lower portion, a core region, and a vortex region of fluid circulating around said core region, said means including

(i) a hollow cylindrical member having first and second inlet and outlet ends and a vertical axis,

(ii) means for rotating said cylindrical member about said vertical axis to cause fluid to circulate around said axis, and

(iii) means for drawing fluid through said rotating cylindrical member in a direction of travel from said second end to said first end;

(b) means for introducing particles into said vortex region, said vortex region causing said particles to rotate around said vertical axis in confined circular paths of travel lying in said vortex region and in a horizontal plane;

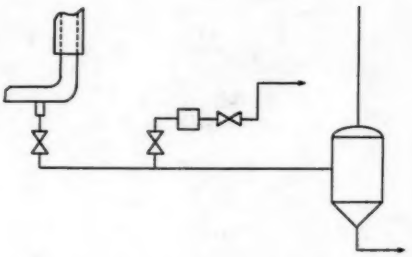
(c) particle treatment means for altering the magnetic properties of particles carried in said vortex region.

5,180,558

METHOD AND APPARATUS FOR TAKING SAMPLES

Jouni Takakarhu, Helsinki, Finland, assignor to Neste OY, Finland

Filed May 30, 1991, Ser. No. 707,463
Claims priority, application Finland, Jun. 7, 1990, 902839
Int. Cl.[5] C08F *2/00*; C08G *85/00*
U.S. Cl. 422—131 7 Claims



1. A method for continuously taking a sample from a product flow removed from a polymerization reactor, which product flow comprises a polymer, a diluent and monomers and which exits from the polymerization reactor via a discontinuously opening discharge valve into a solid-constituent separation container, comprising the steps of

taking the sample from a product tube containing product flow discharged from said polymerization reactor via an on/off type valve,

arranging said on/off valve to be closed for a period of a pressure wave occurring when said discharge valve opens, and

arranging said on/off valve to open after said pressure wave has ended.

7. An apparatus for continuously taking a sample from a discharge flow removed from a polymerization reactor comprising

a polymerization reactor for producing a product comprising a polymer, a diluent and monomers,

a discontinuously opening discharge valve connected to said polymerization reactor,

a product tube leading from said discharge valve, said discharge valve opening for an interval of time to allow said product to enter said product tube, a solid-constituent separation container connected to said product tube for separating said product into constituent parts, a on/off valve connected to a substantially horizontally oriented section of said product tube and oriented above said section, said on/off valve connected to said product tube at a location between said discharge valve and said solid-constituent separation chamber, said on/off valve closing for the period of a pressure wave emanating from said polymerization reactor and occurring when said discharge valve opens and said on/off valve opening after the pressure wave has ended, such that product samples are taken from a product flow removed from said polymerization reactor, and

a buffer container connected at one end to said on/off valve and at another end to analyzing means, said buffer container having a sufficient volume to maintain the continuity of the sample flow to said analyzing means when the on/off valve is closed.

5,180,559

EMISSION CONTROL

Thomas T. Ma, South Woodham Ferrers, Great Britain, assignor to Ford Motor Company, Dearborn, Mich.

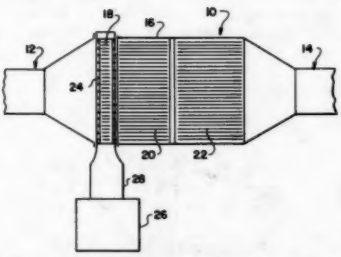
PCT No. PCT/GB90/00756, § 371 Date Oct. 21, 1991, § 102(e) Date Oct. 21, 1991, PCT Pub. No. WO90/14507, PCT Pub. Date Nov. 29, 1990

PCT Filed May 16, 1990, Ser. No. 775,948

Claims priority, application United Kingdom, May 17, 1989, 8911361

Int. Cl.[5] F01N *3/20*

U.S. Cl. 422—168 5 Claims



1. A method of reducing the light-off time of a catalytic converter having a matrix provided with a washcoat containing catalystic particles, which method comprises (i) exposing the matrix of the converter to an alternating magnetic field or to electromagnetic radiation having such a frequency that the washcoat and the particles of catalyst supported by the matrix are heated, and (ii) continuing such heating of said washcoat and particles to the light-off temperature without a corresponding increase in the temperature of the entire matrix.

4. A catalytic converter assembly, comprising a matrix formed of a material which does not absorb microwave radiation, the matrix being coated with a wash coat which is heated when exposed to microwave radiation and which has particles of a catalyst dispersed therein, means for connecting said connector by a waveguide to a source of microwave radiation, the waveguide being constructed to expose the wash coat of at least part of the matrix to the radiation emitted by the source without interfering with the flow of exhaust gases through the converter.

5,180,560

APPARATUS FOR DEHYDROGENATION OF LIQUID HYDRIDES

Gamal E. D. Nasser, Puccheim, Fed. Rep. of Germany, assignor to Mohamed Nasser, Germering, Fed. Rep. of Germany

PCT No. PCT/EP88/00803, § 371 Date May 3, 1989, § 102(e) Date May 3, 1989, PCT Pub. No. WO89/01823, PCT Pub. Date Mar. 9, 1989

Continuation of Ser. No. 350,750, May 3, 1989, abandoned. This PCT application Sep. 3, 1988, Ser. No. 887,376

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729526

Int. Cl.[5] F28D *7/00*; B01J *8/04*; F28F *3/00*

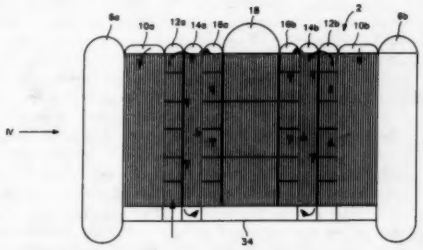
U.S. Cl. 422—189 8 Claims

1. An apparatus for the dehydrogenation of liquid hydrides, comprising

a chemical reactor for the dehydrogenation of heated vaporous hydride wherein hydride fed to the reactor is heated by cooling dehydrogenation products leaving the reactor and further heated in the reactor by the heat of combustion hydrogen in a hot hydrogen-containing gas stream fed to the reactor and the cooled dehydrogenation products are then stored in storage containers, and

said chemical reactor comprises a plurality of combustion chambers connected in series in which hydrogen is combusted and a reactor heat exchanger for transferring heat from combusting hydrogen to dehydrogenating hydride, said reactor heat exchanger comprising a plurality of stages through which the hydride passes during hydrogenation;

said chemical rector is connected in series with a superheating heat exchanger, a vaporizing heat exchanger and a preheating heat exchanger wherein said hydride to be dehydrogenated passes through the preheating heat exchanger, vaporizing heat exchanger and superheating heat exchanger, in series, for heating, and said hydrogen liberated from said hydride in said chemical reactor passes in the reverse direction from said chemical reactor through the superheater heat exchanger and the preheating heat exchanger, for cooling;



said reactor heat exchanger, superheating heat exchanger, vaporizing heat exchanger and preheating heat exchanger each comprise plate-type heat exchangers;

said plate-type heat exchangers are stacked adjacent to each other in series;

said storage containers for storing the dehydrogenation products are positioned at each end of the heat exchanger stack having the heat exchanger stack therebetween;

a pair of substantially parallel plates acting as tie rods connect the storage containers, one on each side of the heat exchanger stack; and

a channel connecting said heat exchangers is placed in a space defined by each of said pair of plates and sides of the heat exchanger stack opposite said plates.

5,180,561

PLATE TYPE REFORMER ASSEMBLY

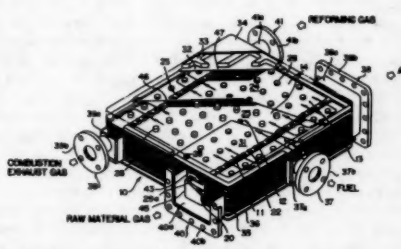
Satoshi Morishima, Kashima, and Sakae Chidiiwa, Tokyo, both of Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1990, Ser. No. 617,996

Claims priority, application Japan, Nov. 27, 1989, 1-304766

Int. Cl.[5] B01J *10/00*

U.S. Cl. 422—191 29 Claims



1. A reformer assembly, comprising:

a multi-layer unit including fuel introduction plates, combustion chamber plates, reforming chamber plates and a separation plate,

each fuel introduction plate having a first plate member and

a first masking frame, the first masking frame being integrally mounted on the periphery of the first plate member, a fuel feeding port being formed in the first masking frame, a pair of first partition members being provided on the fuel introduction plate, each partition member having a crenellated structure, a fuel introduction room being defined between the pair of first partition members, a first entrance room and a first exit room being defined outside the first partition members respectively, the fuel feeding port being open to the first entrance room,

each combustion chamber plate having a second plate member and a second masking frame, the second masking frame being integrally mounted on the periphery of the second plate member, and an air feeding port, an exhaust gas discharging port and a combustion catalyst insertion opening being respectively formed in the second masking frame, a pair of second partition members being provided on the combustion chamber plate, each second partition member having a crenellated structure, a combustion chamber being formed between the second pair of partition members, a second entrance room and a second exit room being defined outside the second pair of partition members respectively, the second plate member having a plurality of dispersion openings between the pair of second partition members, the air feeding port being open to the second entrance room, the exhaust gas discharging port being open to the second exit room, the combustion catalyst insertion opening being open to the combustion chamber, the combustion catalyst insertion opening being aligned with one of the second partition members such that a combustion catalyst moves to the combustion catalyst insertion opening along the one of the second partition members when the combustion catalyst is withdrawn out of the combustion chamber through the combustion catalyst insertion opening,

each reforming chamber plate having a third plate member and a third masking frame, the third masking frame being integrally mounted on the periphery of the third plate member, and a raw material gas feeding port, a reformed gas discharging port and a reforming catalyst insertion opening being respectively formed in the third masking frame, a third pair of partition members being provided on the reforming chamber plate, each third partition member having a crenellated structure, a reforming chamber being defined between the pair of third partition members, a third entrance room and a third exit room being defined outside the pair of third partition members respectively, the raw material gas feeding port being open to the third entrance room, the reformed gas discharging port being open to the third exit room, the reforming catalyst insertion opening being open to the reforming chamber, the reforming catalyst insertion opening being aligned with one of the third partition members such that a reforming catalyst moves to the reforming catalyst insertion opening along the one of the third partition members when the reforming catalyst is withdrawn out of the reforming chamber through the reforming catalyst insertion opening, the fuel introduction plates, the combustion chamber plates and the reforming chamber plates being stacked in turn to define multiple layers, a top one of said layers being referred to as an uppermost layer, the multi-layer unit having a lateral face, with the feeding ports, discharging ports, combustion catalyst insertion openings and reforming catalyst insertion openings being respectively aligned in a direction in which the plates are stacked, the separation plate being provided on the reforming chamber plate of the uppermost layer of the unit, the fuel introduction plate, the combustion chamber plate, the reforming chamber plate and the separation plate being connected to each other at the peripheries thereof;

manifolds attached to the lateral face of the multi-layer unit to cover the feeding and discharging ports;

a combustion catalyst layer being defined by a combustion catalyst in each combustion chamber plate;

a reforming catalyst layer being defined by a reforming catalyst in each reforming chamber plate;

first sealing means for opening and closing the combustion catalyst insertion openings; and

second sealing means for opening and closing the reforming catalyst insertion openings.

5,180,562

APPARATUS FOR PULLING MONOCRYSTALS

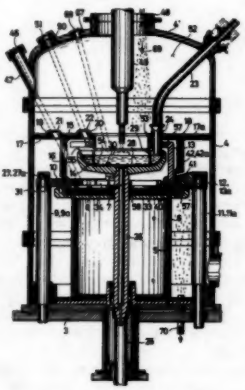
Dieter Drechsel, Bruchkoebel, and Karl Jericho, Hanau, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 127,205, Dec. 1, 1987, abandoned. This application May 30, 1989, Ser. No. 359,032

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1987, 3733487

Int. Cl.[5] C30B *15/14*

U.S. Cl. 422—429 **13 Claims**



1. Apparatus for pulling monocrystal from a melt, comprising:

a vacuum chamber;

a melting crucible in said chamber, said crucible having a bottom surface and an upper margin;

pulling means above said crucible for pulling monocrystal from a melt therein;

a cover above the upper margin of the crucible and having a central opening through which monocrystal is pulled;

a first heating element comprising a substantially flat first radiant heat source below the bottom surface of said crucible and having a central opening to accommodate support means for said crucible; and

a second heating element comprising a plate-like second radiant heat source parallel to said first radiant source and lying between the cover and the upper margin of said crucible and having a central opening through which monocrystal is pulled, the second heating element acting directly on the surface of the melt to maintain the monocrystal in a molten state in the crucible.

5,180,563

TREATMENT OF INDUSTRIAL WASTES

Wen-Chao Lai, Westboro; William J. Rourke, Worcester, and Samuel Natansohn, Sharon, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Oct. 24, 1989, Ser. No. 426,625

Int. Cl.[5] C01F *17/00*; C22B *59/00, 47/00, 7/00*

U.S. Cl. 423—21.5 **9 Claims**

1. A process comprising:

a) contacting a solid waste material containing metal values

that comprise at least tungsten, iron, scandium and manganese and optionally, at least one other metal value which metal is selected from the group consisting of Group III metals, cobalt, nickel and rare earth metals and, other refractory metals selected from the group consisting of tantalum, niobium and mixtures thereof and silicon with a sulfuric acid solution containing a concentration of hydrogen peroxide of at least about 3% by volume for a sufficient time at a sufficient temperature to form a first aqueous acidic leachate containing the major portion of said scandium, manganese, iron and, if present, said other metal values and a first solid residue containing said tungsten, and, if present, said other refractory metals,

b) separating said first aqueous leachate and said first solid residue,

c) digesting said first solid residue with sufficient alkali metal base for a sufficient time to form a first digested solution containing a major portion of said tungsten and a second solid residue containing, if present, said other refractory metals,

d) separating said second solid residue and said first digested solution,

e) leaching said second solid residue with sufficient hydrochloric acid for a sufficient time to form a second acidic leachate and a third solid residue containing the major portion of said other refractory metals, if present,

f) recovering a solid iron containing product and an aqueous solution consisting said manganese, scandium and, if present, said other metal value by a step consisting essentially of adjusting the pH of said first aqueous acid leachate with base to achieve a pH of from about 3 to about 4,

g) separating said solid iron containing product and said aqueous solution containing said manganese, scandium and, if present, said other metal value,

h) adjusting the pH of said aqueous solution containing said manganese, scandium and, if present, said other metal value, with base to achieve a pH of from about 7 to about 8 to yield a solid product containing scandium and, if present, said other metal value, and an aqueous solution containing said manganese,

i) separating said solid product and said aqueous solution containing said manganese,

j) quantitatively recovering a solid manganese continuing product and an aqueous solution essentially depleted of all metal values by oxidizing said aqueous solution containing said manganese at a pH from about 8 to 10 in the presence of a base, and

k) separating said manganese containing product and said aqueous solution essentially depleted of metal values.

5,180,564

PROCESS FOR THE PRODUCTION OF AN AQUEOUS SUSPENSION OF HYDROXYLAPATITE

Friedrich Wahl, Mannheim; Andreas Maurer-Rothmann, Weinheim, and Karl Merkenich, Fuerth/Fahrenbach, all of Fed. Rep. of Germany, assignors to BK Ladenburg GmbH, Ladenburg, Fed. Rep. of Germany

Filed Nov. 22, 1991, Ser. No. 796,254

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1990, 4037103

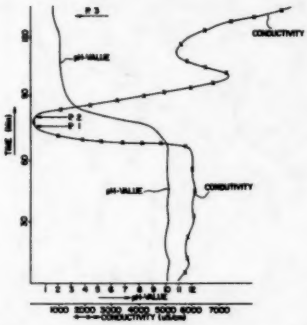
Int. Cl.[5] C01B *25/32*

U.S. Cl. 423—309 **19 Claims**

1. A process for the production of an aqueous suspension of hydroxylapatite comprising the steps of:

a) forming in a vessel, an aqueous solution or aqueous suspension of a calcium compound selected from the group consisting of calcium hydroxide and calcium oxide,

b) admixing and reacting phosphoric acid with said solution or suspension so as to form a second solution or suspension of hydroxylapatite, said second solution having a calcium/phosphorus mole ratio of up to about 10:6; measuring the conductivity of said second solution or suspension of hydroxylapatite at least periodically during the reaction so as to determine the progress of the reaction and the completion of the reaction, and ending the admixing of the phosphoric acid when the conductivity of the reacting



solution has decreased to less than about 10% of the initial value of the conductivity before the addition of the phosphoric acid.

5,180,565

NO REDUCTION USING SUBLIMATION OF CYANURIC ACID

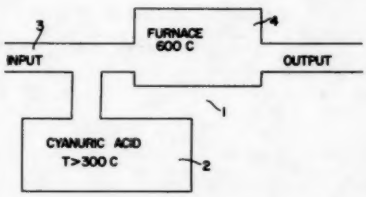
Robert A. Perry, P.O. Box 5024, Livermore, Calif. 94550

Division of Ser. No. 154,247, Jan. 5, 1988, Pat. No. 4,908,193, which is a continuation-in-part of Ser. No. 859,951, May 5, 1986, Pat. No. 4,731,231. This application Mar. 12, 1990, Ser. No. 491,996

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.[5] C01B *21/00*; B01J *8/00*

U.S. Cl. 423—235 **10 Claims**



1. A method of reducing the NO content of a gas stream comprising contacting the gas stream with an amount of cyanuric acid, said amount being effective for resultant lowering of the NO content of the gas stream, said cyanuric acid being particulate and having a particle size of less than 90 μm, said NO reduction being effected by chemical reactions conducted at temperatures in the range of 350°–700° C.

5,180,566

PROCESS FOR THE REMOVAL OF AMMONIA FROM GASES

Thomas Staffel, and Renate Adrian, both of Hürth, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 17, 1991, Ser. No. 731,540

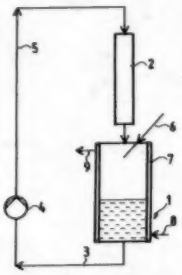
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1990, 4024241

Int. Cl.[5] C01C *3/00*; C01B *15/16, 25/26*

U.S. Cl. 423—238 **6 Claims**

1. A process for the removal of ammonia from water vapor-containing gases, which comprises introducing into a reaction

zone being partially filled with warmed polyphosphoric acid having a P_2O_5 content of from 70 to 88% by weight and a temperature of from 120° to 170° C. the ammonia- and water vapor-containing gases at a rate of from 50 to 200 l per hour and per l of polyphosphoric acid, withdrawing continuously



polyphosphoric acid from the lower part of the reaction zone, and transferring the polyphosphoric acid withdrawn to a column the lower end of which being flow-connected to the reaction zone with the resultant formation of a gas being freed from ammonia and water vapor and an ammonia-saturated polyphosphoric acid.

5,180,567

EXHAUST GAS TREATING METHOD

Masafumi Yoshimoto, Sakai; Tadao Nakatsuji, Nara, and Kimihiko Yoshida, Sakai, all of Japan, assignors to Sakai Chemical Industry Co., Ltd., Osaka, Japan

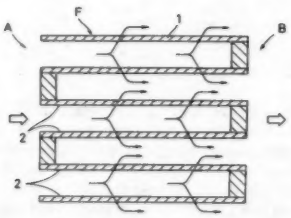
PCT No. PCT/JP90/01031, § 371 Date Mar. 7, 1981, § 102(e) Date Mar. 7, 1991, PCT Pub. No. WO91/01795, PCT Pub. Date Feb. 21, 1991

PCT Filed Aug. 13, 1990, Ser. No. 663,947

Claims priority, application Japan, Aug. 11, 1989, 1-209054

Int. Cl.[5] B01J *8/00;* **C01B** *17/00*

U.S. Cl. 423—239 **6 Claims**



1. In the method of treating an exhaust gas containing particles of hydrocarbonaceous and carbonaceous matter, well as nitrogen oxides, by passing said gas through a catalyst comprising oxidation catalyst means under conditions sufficient to entrap and oxidize said carbonaceous particles, the improvement, whereby removing both said nitrogen oxides and particulates, which comprises passing said exhaust gas through said catalyst at an areal velocity of 100 to 5,000 m^3/hr^2 under a combinaton of conditions sufficient to partially oxidize said hydrocarbonaceous and carbonaceous matter in said particles to an oxidation product comprising carbon monoxide and water, and reacting said nitrogen oxides with said carbon monoxide sufficient to reduce said nitrogen oxides and to oxidize said carbon monoxide.

5,180,568

RECOVERY OF TRITIUM AND DEUTERIUM FROM THEIR OXIDES AND INTERMETALLIC COMPOUND USEFUL THEREIN

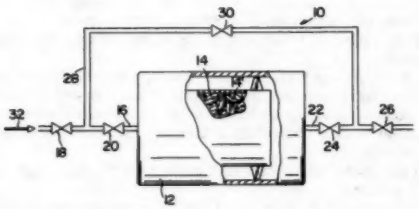
Claudio Boffito, and Massimo Bolognesi, both of Milan, Italy, assignors to SAES Getters SpA, Milan, Italy

Filed May 23, 1991, Ser. No. 704,874

Claims priority, application Italy, Jun. 1, 1990, 20509 A/90

Int. Cl.[5] C01B *3/56, 4/00*

U.S. Cl. 423—248 **12 Claims**



1. A process for the recovery of tritium and deuterium from their oxides characterized by reacting oxides of tritium and oxides of deuterium with an intermetallic compound of the formula, ZrM_2 where M is any transition metal selected from the group consisting of Cr, Mn, Fe, Co, Ni and mixtures thereof, thereby sorbing oxygen and releasing tritium and deuterium.

5,180,569

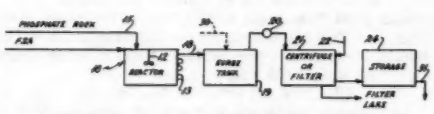
PROCESS FOR THE PRODUCTION OF PHOSPHORIC ACID AND HYDROGEN FLUORIDE FROM PHOSPHATE ROCK AND FLUOSILICIC ACID

William R. Erickson, Lakeland, and Leif E. Bouffard, Mulberry, both of Fla., assignors to Phosphate Engineering and Construction Company, Lakeland, Fla.

Continuation-in-part of Ser. No. 636,254, Dec. 31, 1990, abandoned. This application Dec. 17, 1991, Ser. No. 808,641

Int. Cl.[5] C01B *7/19, 25/16*

U.S. Cl. 423—319 **33 Claims**



1. A process for the production of phosphoric acid and hydrogen fluoride from a feedstock of phosphate rock and fluosilicic acid (FSA) comprising the steps of:

A. reacting the phosphate rock and FSA together to produce a reaction slurry of phosphoric acid, calcium fluoride, silicon dioxide, and undigested phosphate rock;

B. separating the phosphoric acid and calcium fluoride from the undigested phosphate rock and silicon dioxide;

C. mixing the phosphoric acid and calcium fluoride with a sufficient amount of sulfuric acid to convert the calcium fluoride to hydrogen fluoride and calcium sulfate; and

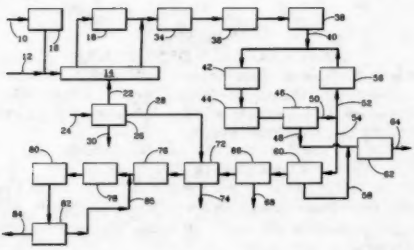
D. recovering the hydrogen fluoride as a concentrated hydrogen fluoride solution or as anhydrous hydrogen fluoride.

5,180,570

INTEGRATED PROCESS FOR MAKING METHANOL AND AMMONIA

Jing M. Lee, 11602 Blair Meadow, Stafford, Tex. 77477, and Joseph R. LeBlanc, 4439 Cherry Oak La., Houston, Tex. 77088

Filed Jan. 23, 1992, Ser. No. 824,954
Int. Cl.[5] C01C *1/04*; C07C *27/06*
U.S. Cl. 423—359 6 Claims



1. An integrated process for making methanol and ammonia, comprising the steps of:

separating air into a substantially pure nitrogen stream and a substantially pure oxygen stream;

reforming a desulfurized hydrocarbon feed with steam at a molar ratio of steam to carbon of from about 2.5 to about 3.5 in a primary reforming zone, at a pressure of from about 2.7 MPa(g) to about 5.2 MPa(g) and at an exit temperature of from about 750° C. to about 900° C., to form a partially reformed hydrocarbon stream;

reforming said partially reformed stream with said oxygen stream and steam in an adiabatic secondary reforming zone, at a pressure of from about 2.7 MPa(g) to about 5.2 MPa(g) and at an exit temperature of from about 900° C. to about 1050° C., to form a methanol synthesis gas makeup stream containing less than about 3 mole percent methane;

passing a methanol synthesis gas feed including said makeup stream to a methanol synthesis zone operated at a pressure of from about 6.2 MPa(g) to about 10.3 MPa(g);

separating a recycle gas stream from methanol produced in the methanol synthesis zone to form a crude methanol stream;

recycling a first portion of said recycle gas stream to said methanol synthesis zone in said methanol synthesis gas feed passage step;

removing a second purge portion of said recycle gas stream as a purge gas stream;

treating said purge gas stream for CO_2 removal;

washing said purge gas stream with nitrogen from said nitrogen stream to remove residual carbon oxides and methane, wherein said purge portion is mixed with a stoichiometric proportion of said nitrogen to produce an ammonia synthesis gas stream;

reacting said ammonia synthesis gas in an ammonia synthesis zone at a pressure of from about 8.3 MPa(g) to about 17.2 MPa(g) to form ammonia;

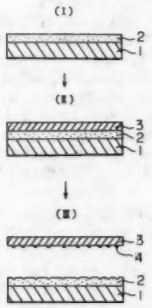
recovering said ammonia from the ammonia synthesis zone.

5,180,571

PROCESS FOR THE PREPARATION OF DIAMOND

Ikuo Hosoya, and Yasuhiro Yoneyama, both of Sodegaura, Japan, assignors to Idemitsu Petrochemical Company Limited, Tokyo, Japan

Filed May 29, 1991, Ser. No. 706,695
Claims priority, application Japan, May 30, 1990, 2-141014; Sep. 6, 1990, 2-236112
Int. Cl.[5] C23C *16/26*
U.S. Cl. 423—446 11 Claims



1. A process for preparing diamond by vapor phase synthesis comprising:

forming an interrupting layer of inorganic powders comprising at least one member selected from the group consisting of SiC, Si, Mo, W, Al_2O_3, Ti, Ta, TiO_2, h-BN, c-BN, SiO_2, B_4C, AlN, Si_3N_4, WC, MoC, graphite, and MoS_2, which have an average particle size of 0.01 to 10 μm, on a surface of a substrate, said interrupting layer having a thickness of 0.1 microns or more so that the entire surface of said substrate is substantially uniformly covered;

depositing diamond on the surface of the interrupting layer with excited raw material gases contacting carbon source gases; and

separating the diamond from the interrupting layer.

5,180,572

CONVERSION OF HYDROGEN SULFIDE TO SULFUR AND HYDROGEN

Mark A. Plummer, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Nov. 19, 1991, Ser. No. 795,408
Int. Cl.[5] C01B *17/05, 3/22*
U.S. Cl. 423—576.7 17 Claims

1. A process for converting hydrogen sulfide gas to sulfur and hydrogen gas comprising the steps of:

a) contacting said hydrogen sulfide gas with a water-soluble quinone which is dissolved in an aqueous solvent containing a complexing agent, said aqueous solvent consisting essentially of water, said complexing agent selected from the group consisting of amines, amides, ureas, and mixtures thereof being present in said aqueous solvent in a range of about 1 mole of said complexing agent to about 4 moles of said quinone to about 1 mole of said complexing agent to about 32 moles of said quinone and reacting with said hydrogen sulfide to form a quaternary ion complex:

b) reacting said hydrogen sulfide gas with said quinone to produce sulfur and a hydroquinone dissolved in said aqueous solvent containing said complexing agent;

c) separating said sulfur from said aqueous solvent and said complexing agent;

d) dehydrogenating said hydroquinone dissolved in said aqueous solvent containing said complexing agent to produce hydrogen gas and to regenerate said quinone dis-

solved in said aqueous solvent and said complexing agent; and

e) recycling said quinone in said aqueous solvent and complexing agent to step a).

5,180,573

METHOD FOR PRODUCING HYDROGEN PEROXIDE

Yasushi Hiramatsu, Tokyo; Yukio Ishiuchi, Ushiku, and Hiromitsu Nagashima, Matsudo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 20, 1991, Ser. No. 811,035

Claims priority, application Japan, Feb. 8, 1991, 3-039209

The portion of the term of this patent subsequent to Jul. 21, 2009, has been disclaimed.

Int. Cl.[5] C01B *15/01*

U.S. Cl. 423—584 13 Claims

1. A method for producing hydrogen peroxide wherein oxygen and hydrogen are reacted in the reaction medium in the presence of a catalyst comprising a metallic or carrier supported platinum group metal catalyst onto which an organic halogen compound which is insoluble in water, which compound excludes compounds which contain no halogen other than fluorine, has been adsorbed or a platinum group metal catalyst supported on a carrier in which a halogenated organic compound which is insoluble in water, which compound excludes compounds containing no halogen other than fluorine, has been adsorbed to the carrier prior to supporting the platinum group metal.

5,180,574

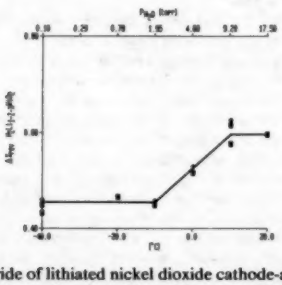
HYDRIDES OF LITHIATED NICKEL DIOXIDE AND SECONDARY CELLS PREPARED THEREFROM

Ulrich Von Sacken, Port Coquitlam, Canada, assignor to Moli Energy (1990) Limited, Canada

Continuation-in-part of Ser. No. 556,764, Jul. 23, 1990. This application Jan. 30, 1992, Ser. No. 828,772

Int. Cl.[5] C01B *6/24*

U.S. Cl. 423—594 68 Claims



1. A hydride of lithiated nickel dioxide cathode-active material for an electrochemical cell, having a stoichiometric formula $Li_{x-z}H_zNi_{2-x-y}M_yO_2$, wherein x is between about 0.80 and about 1.00, M is one or more metals selected from the group consisting of cobalt, iron, chromium, titanium, manganese and vanadium, y is less than about 0.2, with the proviso that y is less than about 0.5 for cobalt, and z is less than about 0.3.

5,180,575

COMPOSITION FOR ENHANCING ORAL HYGIENE, CONTAINING BAMBOO-SALT

Jae M. Ha; Kwang L. Jeong, and Sung S. Suh, all of Pongmyung-dong, Rep. of Korea, assignors to Lucky, Ltd., Seoul, Rep. of Korea

Filed Dec. 27, 1991, Ser. No. 813,934

Claims priority, application Rep. of Korea, Dec. 28, 1990, 90-22099

Int. Cl.[5] A61K *7/16, 7/26*

U.S. Cl. 404—49 10 Claims

1. An oral hygiene composition which comprises a 0.1 to 30% by weight of a bamboo-salt alone based on the total weight of the composition or a mixture of bamboo-salt and sodium chloride said mixture being in a mixed ratio of 1:5 to 1:15.

5,180,576

ANTICALCULUS DENTIFRICES

Anthony E. Winston, East Brunswick; Regina M. Miskewitz, Hillsborough; Darlene R. Walley, Princeton, and John R. Berschied, Lawrenceville, all of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Aug. 30, 1991, Ser. No. 753,340

Int. Cl.[5] A61K *7/16, 7/18*

U.S. Cl. 424—52 15 Claims

1. A dentifrice composition comprising a toothpaste or dental gel for inhibiting calculus formation incorporating, in an orally acceptable vehicle,

(a) as substantially the sole abrasive in the composition, sodium bicarbonate in an amount of from 8 to 65% by weight of the paste or gel;

(b) from 1.5 to 13.5% by weight of undissolved tetrasodium pyrophosphate decahydrate salted-out by the sodium bicarbonate in the form of relatively small particles which are similar in size or only slightly larger than the sodium bicarbonate particles;

(c) no more than 1.5% of pyrophosphate ions dissolved in the aqueous phase of the paste or gel; and

(d) a soluble fluoride ion source sufficient to supply form 25 to 5,000 ppm fluoride ion.

5,180,577

STABILIZED BIS BIGUANIDE/ANIONIC ACTIVE INGREDIENT COMPOSITIONS

Thomas G. Polefka; Deborah S. Sanai, both of Somerset, and Brian S. Jannone, Basking Ridge, all of N.J., assignors to Colgate-Palmolive, New York, N.Y.

Filed Oct. 9, 1990, Ser. No. 594,502

Int. Cl.[5] A61K *7/16, 7/18, 7/22*

U.S. Cl. 424—52 12 Claims

1. An oral composition consisting essentially of 0.01 to about 5.0% by weight of a plaque reducing cationic bisbiguanide antibacterial agent and an effective quantity of a fluorine-providing anionic agent, the anionic agent being present in an amount sufficient to release from about 0.005 up to 1% by weight fluoride ion, said cationic and anionic agents being stabilized by a precipitation-inhibiting quantity of a betaine surfactant, said betaine surfactant being present in a quantity in which the weight ratio of betaine to bisguanide (BBR) is effective to prevent precipitation and insufficient to decrease the efficacy of the plaque-reducing activity of said cationic bisguanide antibacterial agent, the BBR ranging from the minimum BBR to a BBR of less than about 8.

5,180,578

ANTIBACTERIAL ANTIPLAQUE ANTICALCULUS ORAL COMPOSITION

Abdul Gaffar, Princeton; Nuran Nabi, North Brunswick; John Afflitto, Brookside, all of N.J., and Orum Stringer, Yardley, Pa., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 395,605, Aug. 25, 1989, abandoned, which is a continuation-in-part of Ser. No. 346,258, May 1, 1989, Pat. No. 5,043,154, which is a continuation of Ser. No. 8,901, Jan. 30, 1987, abandoned. This application Feb. 19, 1991, Ser. No. 657,885

The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.

Int. Cl.[5] A61K *7/16, 7/18*

U.S. Cl. 474—52 **26 Claims**

1. In a method of preparing an oral composition wherein delivery and retention of a plaque-inhibiting antibacterial agent is enhanced by attaching, adhering or bonding to oral surfaces comprising an orally acceptable aqueous vehicle, an effective amount in the range of about 0.01–5% by weight of substantially water insoluble noncationic antibacterial agent and polyphosphate anticalculus amount in an effective anticalculus amount present as a mixture of potassium and sodium salts, the improvement comprising employing potassium and sodium in said composition in a ratio of up to less than 1:1 and employing about 0.5–5% by weight of a water-soluble or swellable antibacterial-enhancing agent which contains at least one delivery-enhancing functional group and at least one organic retention-enhancing group, which said delivery-enhancing group enhances delivery of said antibacterial agent to oral tooth and gum surfaces and said retention-enhancing group enhances attachment, adherence or bonding of said antibacterial agent on oral tooth and gum surfaces.

5,180,579

TOPICAL COMPOSITION COMPRISING A MIXTURE OF PARTICULAR DI-ALKYL OR ALKENYL PHOSPHATE ESTERS AND MONO-ALKYL OR ALKENYL PHOSPHATE ESTERS

David H. Birtwistle; Peter Cartere, and David A. Rosser, all of Merseyside, England, assignors to Chesebrough-Pond's USA Co., division of Conopco, Inc., New York, N.Y.

Filed Sep. 27, 1991, Ser. No. 768,480

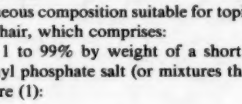
Claims priority, application United Kingdom, Dec. 1, 1988, 8828017

Int. Cl.[5] A61K *7/06*

U.S. Cl. 424—70 **21 Claims**

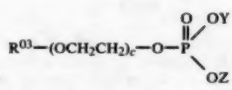
1. An aqueous composition suitable for topical application to the skin or hair, which comprises:

(a) from 1 to 99% by weight of a short chain dialkyl or dialkenyl phosphate salt (or mixtures thereof) having the structure (1):



(1)

(b) from 1 to 99% by weight of a monoalkyl or monoalkenyl phosphate salt (or mixture thereof), having the structure (2):



(2)

where

R^{01} and R^{02} are each chosen from branched or unbranched alkyl or alkenyl groups having an average of from 7 to 9 carbon atoms;

R^{03} is chosen from branched or unbranched alkyl or alkenyl groups having an average of from 12 to 18 carbon atoms;

X, Y and Z are each chosen from H, alkali metal, ammonium and substituted ammonium counterions; and a, b and c are each chosen from 0, or a value of from 1 to 4 and wherein the weight ratio of the monoalkyl or monoalkenyl phosphate salt to the short chain dialkyl or dialkenyl phosphate salt is from 9:1 to 1:2.3.

5,180,580

HAIRSTYLING PREPARATIONS CONTAINING AMIDOFUNCTIONAL SILOXANES

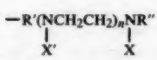
Daniel J. Halloran, and Christine M. Handt, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 10, 1992, Ser. No. 833,262

Int. Cl.[5] A61K *7/11, 7/06*

U.S. Cl. 424—71 **6 Claims**

1. In a hairstyling preparation which includes as ingredients thereof an anionic organic polymeric film forming resin which is a polyacrylate and an alcohol solvent, the improvement comprising incorporating into the hairstyling preparation as an ingredient thereof an amidofunctional polysiloxane having an average of fifty to one thousand siloxane units per molecule with an average of one to fifty of the siloxane units per molecule being amide-containing siloxane units bearing a substituent of the formula:



wherein n has a value of zero or one; R' is an alkylene radical of three to six carbon atoms; R'' is a hydrogen radical or an alkyl radical of one to six carbon atoms; X is an acyl radical of the formula:

X' is a hydrogen radical or X; R''' is an alkyl radical of one to four carbon atoms; and wherein substantially all other organic substituents in the polysiloxane are methyl groups said organic polymeric film forming resin and said amidofunctional polysiloxane being present in the hairstyling preparation in a weight ratio from 2:1 to 1:2.

5,180,581

BIOLOGICAL INSECT CONTROL AGENTS AND METHODS OF USE

Lois K. Miller, and David R. O'Reilly, both of Athens, Ga., assignors to University of Georgia Research Foundation, Inc., Athens, Ga.

Filed Jun. 29, 1989, Ser. No. 373,952

Int. Cl.[5] A01N *63/00;* **C12N** *15/01*

U.S. Cl. 424—93 A **5 Claims**

1. An insect control agent, wherein said insect control agent is a nuclear polyhedrosis virus in which a naturally occurring gene encoding an ecdysteroid UDP-glucosyl transferase is inactivated.

5,180,582

SUPEROXIDE DISMUTASE DERIVATIVES, A METHOD OF PRODUCING THE SAME AND MEDICINAL USES OF THE SAME

Hiroshi Maeda, 631-3, Aza-Tamukae, Hotakubobon-machi, Kumamoto City, Japan; Fujio Suzaki, Galveston, Tex., and Tatsuya Oda, Kumamoto, Japan, assignors to Hiroshi Maeda, Kumamoto and Kuraray Co., Ltd., Okayama, both of, Japan

Division of Ser. No. 199,809, May 27, 1988. This application Feb. 19, 1992, Ser. No. 836,861

Claims priority, application Japan, May 28, 1987, 62-134563

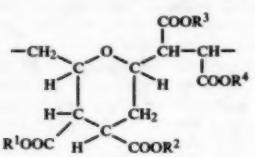
Int. Cl.[5] A61K *37/50*

U.S. Cl. 424—94.4 **5 Claims**

1. A method of treating an inflammatory disease which comprises administering to a patient with the disease a therapeutically effective amount of a superoxide dismutase derivative of the general formula

$$[SOD][Z]_n$$

wherein [SOD] represents a superoxide dismutase having 1 to 22 or 24 groups each derived from an amino group by removal of one hydrogen atom in lieu of amino groups; [Z] represents a monovalent copolymer group, constituting units of which are a group of the formula



wherein R^1, R^2, R^3 and R^4 each represents a hydrogen atom or a residue group derived by removal of a hydroxyl from an alkanol of 1 to 8 carbon atoms, an ethylene glycol monoalkyl ether containing an alkyl moiety of 1 to 4 carbon atoms or a glycerin dialkyl ether containing alkyl moieties of 1 to 4 carbon atoms, provided that either R^1 or R^2 and either R^3 or R^4 each represents a hydrogen atom, and a residue derived from the group of the above-mentioned formula by removal of OR^1, OR^2, OR^3 or OR^4 group from one of its $COOR^1$, $COOR^2$, $COOR^3$ and $COOR^4$ groups (where the bond on the carbon atom of the carbonyl group is attached to [SOD]), said monovalent copolymer group having an average molecular weight of 500 to 200,000; and n represents an integer of 1 to 22 or 24 corresponding to the number of said groups each derived from an amino group by removal of one hydrogen atom in said [SOD], or a pharmaceutically acceptable salt thereof.

5,180,583

METHOD FOR THE TREATMENT OF BLEEDING DISORDERS

Ulla K. E. Hedner, Bagangsvagen 29, SE-21620 Malmo, Sweden

Continuation of Ser. No. 368,967, Jun. 19, 1989, abandoned, which is a continuation of Ser. No. 933,408, Nov. 20, 1986, abandoned. This application Mar. 8, 1991, Ser. No. 666,423

Claims priority, application Denmark, Nov. 26, 1985, 5446/85; Sep. 26, 1986, 4592/85

Int. Cl.[5] A61K *37/547, 35/16;* **C07K** *15/06*

U.S. Cl. 424—94.64 **9 Claims**

1. A method for treating patients suffering from a platelet disorder caused by impaired platelet function or a low number of circulating platelets but not caused by a blood clotting factor disorder, factor VIII:c deficiency or von Willebrand factor deficiency comprising administering to a patient suffering from said platelet disorder a composition comprising more than 125 units to about 1000 units of factor VIIa/kg of body weight together with a physiologically acceptable carrier or diluent.

5,180,584

WASHING COMPOSITIONS BASED ON INSOLUBLE SILICONES AND ON A SURFACE-ACTIVE AGENT OF THE POLYOXYALKYLENATED CARBOXYLIC ETHER ACID TYPE, AND THEIR APPLICATION IN COSMETICS AND IN DERMATOLOGY

Claude Sebag, Paris, and Claude Dubief, Le Chesnay, both of France, assignors to L'Oreal, Paris, France

Filed Jan. 31, 1991, Ser. No. 648,848

Claims priority, application France, Jan. 31, 1990, 90 01149

Int. Cl.[5] A61K *7/075, 7/48*

U.S. Cl. 424—401 **35 Claims**

1. Washing composition for hair or the skin, comprising in an aqueous medium:

a) a silicone which is insoluble in the said medium and not reactive with the latter; and

b) at least 7% by weight of at least one compound corresponding to the following formula:

$$R—(OC_3H_6)_p—(OC_2H_4)_n—OCH_2—COOA \quad (I)$$

in which:

R denotes a linear or branched, C_8–C_{22} alkyl or alkenyl radical or mixture of such radicals, alkyl(C_8–C_9)phenyl or R'CONH—CH_2—CH_2—, with R' denoting a C_{11}–C_{21}, linear or branched, alkyl or alkenyl radical;

n is a whole or decimal number between 2 and 24,

p is a whole or decimal number between 0 and 6,

A denotes a hydrogen atom or an atom of Na, K, Li, ½ Mg or a monoethanolamine, ammonium or triethanolamine residue,

the weight ratio of compound of formula (I)/insoluble silicone being higher than 1.

5,180,585

ANTIMICROBIAL COMPOSITIONS, PROCESS FOR PREPARING THE SAME AND USE

Howard W. Jacobson; Michael H. Scholla, both of Wilmington, and Sam L. Samuels, Claymont, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 9, 1991, Ser. No. 742,963

Int. Cl.[5] A01N *59/20, 25/26*

U.S. Cl. 424—405 **20 Claims**

1. An antimicrobial composition comprising tens of microns to submicron inorganic core particles selected form the group consisting of the oxides of titanium, aluminum, zinc and copper, sulfates of calcium, strontium and barium, zinc sulfide, copper sulfide, zeolites, mica, talc, kaolin, mullite and silica, said core particles having a primary surface coating, comprising 0.05 to 20% by weight based on the core particles, of a metal or metal compound having antimicrobial properties selected from the group consisting of silver, silver oxide, silver halides, copper, copper (I) oxide, copper (II) oxide, copper sulfide, zinc oxide, zinc sulfide, zinc silicate and mixtures thereof, which are coated with a secondary protective layer comprising 0.5 to 20% by weight and is selected from the group consisting of silica, silicates, borosilicates, aluminosilicates, alumina, aluminum phosphate and mixtures thereof.

5,180,586

ACARICIDAL COMPOSITION

Toshiya Sato, and Hamako Hata, both of Tokyo, Japan, assignors to Takasago International Corporation, Tokyo, Japan

Filed Oct. 18, 1990, Ser. No. 599,575

Claims priority, application Japan, Oct. 19, 1989, 1-272401

Int. Cl.[5] A01N *25/00*

U.S. Cl. 424—405 **5 Claims**

1. A method for exterminating house dust acari, which comprises applying to an area or space infested with accari an acaricidal composition consisting essentially of one or more compounds selected from the group consisting of methyl cinnamate, ethyl cinnamate, n-propyl cinnamate, isopropyl cinnamate, n-butyl cinnamate, isobutyl cinnamate isoamyl cinna-

mate, n-hexyl cinnamate, allyl cinnamate, cinnamyl acetate, cinnamyl propionate, cinnamyl n-butyrate, cinnamyl isobutyrate, p-cresyl acetate, p-cresyl butyrate, p-cresyl isobutyrate, p-methylbenzyl propionate, β-phenoxyethyl alcohol, phenoxyethyl acetate, phenoxyethyl propionate, phenoxyethyl n-butyrate, phenoxyethyl isobutyrate, methyl phenylacetate, ethyl phenylacetate, dibenzyl ether, heliotropin, methyl diphenyl ether and 2-methyl-1-(methylbicyclo[2.2.1]hept-5-en-2-yl)-1-penten-3-ol as an active ingredient to a portion where dust acari inhabit, wherein the composition is applied in a dose of approximately 80 mg or more per m^2 of the area to be treated or approximately 8 mg or more per m^3 of the space to be treated.

5,180,587

TABLET FORMULATIONS OF PESTICIDES

Earl P. Moore, Anderson, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US89/02072, § 371 Date Dec. 6, 1990, § 102(e) Date Dec. 6, 1990

Continuation-in-part of Ser. No. 212,668, Jun. 28, 1988, abandoned. This PCT application May 17, 1989, Ser. No. 613,836

Int. Cl.[5] A01N *25/12*; A61K *9/46*

U.S. Cl. 424—408 **20 Claims**

1. A tablet formulation consisting essentially of, by total weight of the formulated composition:

(i) 20% to 75% of a pesticide or growth regulant having a melting point of at least 100° C. and a water solubility at 20° C. of no more than 5% by weight, and

(ii) 25% to 80% of a delivery system characterized by a panel of components complementary to the pesticide of (i) that consists essentially of the following components:

(a) 5% to 20% of a dibasic or tribasic organic carboxylic acid or a mixture thereof;

(b) 7% to 50% of an ammonium or alkali metal carbonate or bicarbonate or a mixture thereof;

(c) 0.5% to 20% of a dispersant,

(d) about 0.1% to 5% of water-insoluble cross-linked polyvinylpyrrolidone, and

(e) 0.1% to 5% of an anionic or nonionic wetting agent;

the formulation forming a dispersion in water, fine enough to pass a 50 mesh screen without clogging it and having a specific gravity greater than 1.00.

5,180,588

LIVER FUNCTION IMPROVER

Yoshifumi Shinmen, Nagaokakyo; Kengo Akimoto, Mishima; Sumio Asami, Ibaraki; Yoshihide Suwa, Ibaraki; Yoshinori Kitagawa, Ibaraki; Michihiro Sugano, Fukuoka; Hideaki Yamada, and Sakayu Shimizu, both of Kyoto, all of Japan, assignors to Suntory Limited, Osaka, Japan

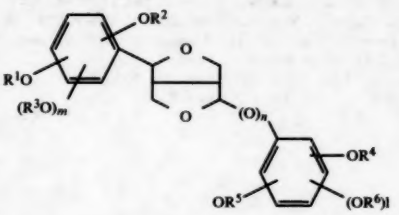
Filed Jul. 20, 1990, Ser. No. 555,586

Claims priority, application Japan, Jul. 21, 1989, 1-187497; Apr. 3, 1990, 2-87500

Int. Cl.[5] A61K *47/00*

U.S. Cl. 424—439 **3 Claims**

1. A pharmaceutical composition of matter for the prevention or treatment of fatty liver or liver disorders, or to decrease glutamic-oxaloacetic aminotransferase, glutamic-pyruvic aminotransferase, serum total cholesterol, serum triglyceride, serum total bilirubin or neutral fat in a mammalian organism, said composition comprising an effective amount of a dioxabicyclo[3.3.0]octane derivative of the formula (I):



(I)

wherein R^1, R^2, R^3, R^4, R^5 and R^6 independently represent a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, or R^1 and R^2 and/or R^4 and R^5 together form a methylene group or an ethylene group, and n, m and l are 0 or 1, to prevent or treat fatty liver or liver disorder, or to decrease glutamic-oxaloacetic aminotransferase, glutamine-pyruvic aminotransferase, serum total cholesterol, serum triglyceride, serum total bilirubin or neutral fat in a mammalian organism, when R^1 and R^2 together and R^4 and R^5 together are not methylene when n, m and l are 0, and a pharmaceutically acceptable carrier therefor.

5,180,589

PRAVASTATIN PHARMACEUATICAL COMPOSITIONS HAVING GOOD STABILITY

Yatindra M. Joshi, Piscataway; Pierina Chiesa, South Orange, and Nemichand B. Jain, Monmouth Junction, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 176,127, Mar. 31, 1988, Pat. No. 5,030,447. This application May 20, 1991, Ser. No. 703,326

The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.

Int. Cl.[5] A61K *9/14*, *9/20*

U.S. Cl. 424—465 **12 Claims**

1. A stabilized pravastatin composition, which comprises pravastatin and one or more basifying agents, compatible with pravastatin, to impart a desired pH of at least 9 to an aqueous dispersion of said composition.

5,180,590

PROCESS FOR THE PREPARATION OF ANTI-INFLAMMATORY PHARMACEUTICAL AGENTS WITH AN IBUPROFEN BASE, WITH ELIMINATION, IN SOLUTION, OF THE BITTER TASTE, BURNING OF THE THROAT AND INTESTINAL TOXICITY

Mario Carcano, Vezia, and Massimo Costa, Arzo, both of Switzerland, assignors to Aesculapius-Pharma S.A., Mezzovico, Switzerland

Filed Jun. 13, 1989, Ser. No. 372,633

Claims priority, application Switzerland, Jul. 12, 1988, 2647/88

Int. Cl.[5] A61K *9/46*, *31/19*

U.S. Cl. 424—466 **6 Claims**

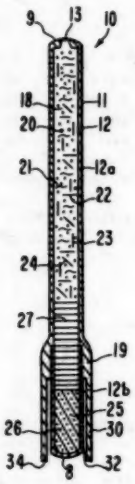
1. An anti-inflammatory pharmaceutical composition, consisting essentially of the following ingredients in intimate admixture: 200 to 800 mg ibuprofen or 221.3 to 885.2 mg ibuprofen sodium salt, 2.100 to 8.402 g sodium bicarbonate, and 0.450 to 1.800 g citric acid.

5,180,591

DELIVERY DEVICE WITH A PROTECTIVE SLEEVE

Judy A. Magruder, Mountain View; John R. Peery, Palo Alto, and James B. Eckenhoff, Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Jul. 11, 1990, Ser. No. 551,720
Int. Cl.[5] A61K *9/24*
U.S. Cl. 424—473 6 Claims



1. A method for delivering a beneficial agent to an animal, wherein the method comprises:

(1) admitting into the animal a dispenser comprising:

(a) a first wall section comprising a wall that surrounds an internal compartment and an open end;

(b) a second wall section comprising a wall that surrounds an internal compartment and an open end, the wall comprising a composition permeable to the passage of fluid, wherein the open end of the first wall section and the open end of the second wall section are in mated contact;

(c) a rigid sleeve extending from the first wall section to cover the junction of the first wall section and the second wall section and to at least partially cover the sides of the second wall section, the inside diameter of the sleeve being greater than the outside diameter of the second wall section, and the sleeve being able to resist transient mechanical forces of at least about 2 kilograms force;

(d) a beneficial agent in the compartment comprising the first wall section;

(e) at least one expandable driving member in the compartment comprising the second wall section for pushing the beneficial agent from the compartment; and

(f) exit means for delivering the beneficial agent to the animal;

(2) allowing fluid to be imbibed through the permeable second wall section of the dispenser for causing the expandable driving member or members to increase in volume; and

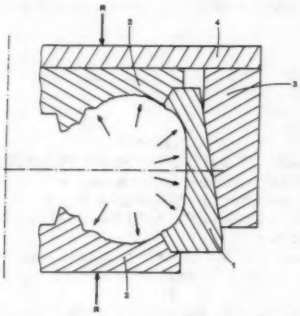
(3) delivering the beneficial agent to the animal by the driving member or members increasing in volume and occupying space in the compartment comprising the first wall section, thereby pushing the beneficial agent through the exit means to the animal.

5,180,592

SELF-LOCKING SECTOR-TYPE MOLD FOR THE VULCANIZATION OF TIRES

Daniel Laurent, Meylan, France, assignor to Compagnie Generale des Etablissements Michelin—Michelin & Cie, Clermont-Ferrand Cedex, France

Filed Nov. 26, 1990, Ser. No. 617,656
Claims priority, application France, Jan. 2, 1990, 90 00039
Int. Cl.[5] B29C *35/02;* B29D *30/52*
U.S. Cl. 425—46 2 Claims



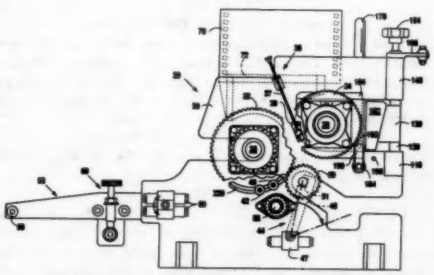
1. A sector-type mold for the molding and vulcanizing of tires in which the mold includes outer sectors for molding the tire treads and shells for molding the side walls of the tire, said mold comprising a protrusion at the lateral edges of each sector which protrusion extends radially towards the axis of the mold, a flange on each protrusion which flange extends axially towards the inside of the mold and has a frustoconical surface included by an angle α with respect to the axis of the mold in such a manner that extensions of races of each frustoconical surface on a meridian plane intersect on the radially inner side of the sector in question, a complementary protrusion on the radially outer end of each shell and a flange on each complementary protrusion having a frustoconical surface inclined by the same angel α with respect to the axis of the mold.

5,180,593

SHEETER MACHINE

Joseph L. Mistretta, Riverside, and Jesus E. Reyes, Whittier, both of Calif., assignors to Meyer Tempco, Inc., San Antonio, Tex.

Filed Feb. 14, 1991, Ser. No. 656,251
Int. Cl.[5] A21C *3/02, 11/04;* B29C *43/46, 43/50*
U.S. Cl. 425—202 18 Claims



1. A sheeter machine, comprising:

first and second rollers, wherein said first and second rollers have first and second shafts, respectively, and said first and second shafts are substantially parallel and lie in sub-

stantially horizontal planes such that said shaft of said second roller is below said shaft of said first roller;

means for separating dough from a back side of said second roller;

a cutting member for acting against said back side of said second roller to cut said dough;

means for pivotally supporting said cutting member;

a discharge arm positioned beneath said second roller; and

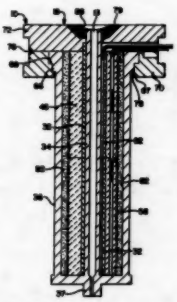
wherein said means for separating said dough from said second roller is positioned such that said cut dough is stripped from said second roller as said cut dough travels toward said discharge arm.

5,180,594

INTERNALLY HEATED SPRUE BUSHING WITH THERMALLY CONDUCTIVE SLEEVE

Panos Trakas, 1820 Amelia La., Addison, Ill. 60101

Division of Ser. No. 507,392, Apr. 10, 1990, Pat. No. 5,052,100.
This application Aug. 19, 1991, Ser. No. 746,966
The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.
Int. Cl.[5] B29C *45/72*
U.S. Cl. 425—547 **18 Claims**



1. An internally heated sprue bushing assembly having an inlet for receiving pressurized melt and an outlet for discharge of the pressurized melt, said sprue bushing assembly comprising:

a bushing casing-core element having an integral outer sidewall and an endwall and an elongated inner core, the outer surface of said elongated inner core and the inner surface of said sidewall defining a generally annular compartment within said bushing casing core element;

heat conducting means in surrounding relation to said elongated inner core, said heat conducting means axially extending a preselected length within and occupying a portion of said annular compartment;

heating means in surrounding relation to said heat conducting means and elongated inner core, said heating means axially extending a preselected length within and occupying a portion of said annular compartment;

a compacted unified mass of particulate material occupying the remainder of said annular compartment; and

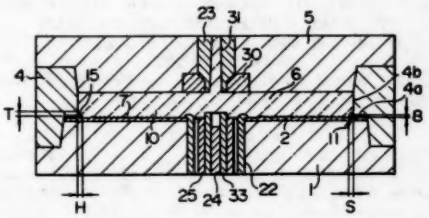
a melt runner passage in said elongated inner core interposed between and in flow communication with said inlet and outlet of said sprue bushing assembly.

5,180,595

METAL MOLD FOR RESIN SUBSTRATE FOR AN OPTICAL RECORDING MEDIUM

Shinitsu Kinoshita, Toride, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 502,125, Mar. 30, 1990, abandoned.
This application Jun. 2, 1992, Ser. No. 892,479
Claims priority, application Japan, Mar. 31, 1989, 1-078482; Mar. 5, 1990, 2-051880
Int. Cl.[5] B29D *17/00*; B29C *45/00*
U.S. Cl. 425—556 **7 Claims**



1. A metal mold for fabricating a resin substrate for an optical recording medium having a light incident surface and a signal pattern surface comprising:

a stamper on which a reverse pattern of a signal pattern which is to be transferred onto said resin substrate is formed,

a backing plate for reinforcing said stamper,

a stamper inner circumference presser for fixing an inner circumference of said stamper to said backing plate,

a stamper outer circumference presser having a first free end and a second stepped clamping end for loosely restricting an outer circumference of said stamper; and

a mirror plate having an outer peripheral stepped portion for engaging said first free end of said stamper outer circumference presser,

said second stepped clamping end of said outer circumference presser having a medial portion for providing a clearance between said stamper and said outer circumference presser and a lateral portion which engages a stepped portion of said backing plate, said medial portion having a side surface a portion of which engages said outer peripheral stepped portion of said mirror plate and a portion of which forms a cavity side surface, whereby as a result of constructing said metal mold a cavity is defined between said mirror plate, said stamper and said cavity side surface of said medial portion of said outer circumference presser, said cavity side surface of said medial portion of said outer circumference presser having a circumferential lower edge which extends into said cavity, a distance between said side surface portion juxtapositioned said outer peripheral stepped portion of said mirror plate being greater than a distance between said side surface portion which forms said cavity side surface,

said clearance between said stamper and said outer circumference presser having a dimension such that upon fabrication of said resin substrate a burr is permitted to form around a circumference of said signal pattern surface of said substrate in conformity with said clearance, an external dimension of said burr extending radially from said signal pattern surface of said resin substrate being smaller than an external dimension of said light incident surface so that said burr never projects outside a circumference of said light incident surface of said substrate.

5,180,596

METHOD FOR RIPENING CHEESE UNDER HIGH PRESSURE

Hitoshi Yokoyama, Sennan; Norio Sawamura, Hashimoto, and Noriko Motobayashi, Kaizuka, all of Japan, assignors to Fuji Oil Co., Ltd., Osaka, Japan

Filed Jul. 29, 1991, Ser. No. 737,232
Claims priority, application Japan, Jul. 31, 1990, 2-204465
Int. Cl.[5] A23C *9/12*
U.S. Cl. 426—36 4 Claims

1. A method for producing cheese, comprising a step of ripening the cheese under a pressure of 100–2500 kg/cm^2 in the presence of lactobacilli, the pressure reducing the ripening time.

5,180,597

PROCESS FOR THE PRODUCTION OF HYDROLYZED VEGETABLE PROTEINS USING GASEOUS HYDROCHLORIC ACID AND THE PRODUCT THEREFROM

Donald J. Hamm, New Providence, N.J., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Jan. 14, 1991, Ser. No. 641,037
Int. Cl.[5] A23J *3/14*
U.S. Cl. 426—52 26 Claims

1. A process for the production of hydrolyzed vegetable proteins containing no detectable level of monochlorodihydroxypropanol, which comprises:

(a) hydrolyzing a protein by adding it to an aqueous solution of at least one protease;

(b) separating the hydrolyzed soluble protein from any insoluble mass;

(c) concentrating the hydrolyzed soluble protein to a low moisture content;

(d) contacting the hydrolyzed soluble protein with gaseous hydrochloric acid for a period of not more than four (4) hours to substantially deamidate the hydrolyzate; and

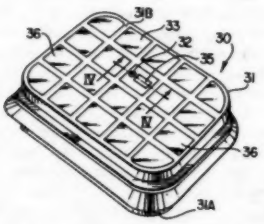
(e) neutralizing the deamidated hydrolyzate.

5,180,598

LIQUID AND/OR TEMPERATURE ACTIVATED ELAPSED TIME INDICATORS SUITABLE, IN PARTICULAR, AS DONENESS INDICATORS FOR FOODSTUFFS

Mark A. Jozefowicz, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed May 2, 1990, Ser. No. 518,022
Claims priority, application Canada, Apr. 11, 1990, 2014409
Int. Cl.[5] A23L *1/025*
U.S. Cl. 426—88 13 Claims



9. A package for a water-containing foodstuff, which comprises:

a container for said foodstuff having an exterior wall;

an opening, or a region capable of being penetrated to form an opening, in said exterior wall, and

a liquid-activated elapsed time indicator to provide an indication of doneness of said foodstuff upon heating of said package, said indicator being positioned outside said exterior wall sufficiently close to said opening or said region to be contacted by water emerging from said opening as said foodstuff is heated;

said indicator comprising:

a structure, having open pores to permit entry, retention and egress of fluids, which structure comprises an optically thin porous transparent film covering an at least partially reflective metal substrate and which generates a first color by optical interference effects when pores of said structure are gas-filled and a second contrasting color when pores of said structure are liquid-filled;

a transparent or translucent cover overlying said porous transparent film and adhered adjacent to lateral edges of said structure but remaining, at least in limited areas thereof, unattached to said structure and spaced therefrom by a distance which results in capillary movement of liquid positioned between said structure and said cover in said at least limited areas; and

an entrance to permit liquid to enter between said structure and said cover;

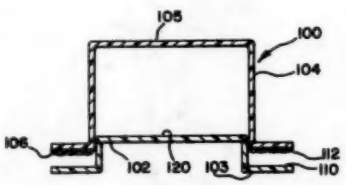
said entrance being positioned with respect to said at least limited areas such that an area of said second contrasting color expanding from said entrance as liquid passes therethrough can serve as an indicator of elapsed time.

5,180,599

PEELABLE ADHESIVE-BASED PACKAGE SEAL AND METHOD OF MAKING SAME

Daniel R. Feldmeier, Waunakee, and Michael McCann, Madison, both of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Mar. 8, 1991, Ser. No. 666,753
Int. Cl.[5] B65D *85/00*
U.S. Cl. 426—106 26 Claims



1. A method of making an adhesive-based hermetic, peelable seal for a food product package, in which the peelable seal uniformly ruptures when the package is opened, without the adhesive stringing comprising the steps of:

providing first and second package panels, at least one of said package panels being a polyacrylonitrile film;

subjecting a surface of one of said first and second package panels which is a polyacrylonitrile film to a corona discharge to increase the surface tension thereof and reduce the adhesion characteristics thereof between said one polyacrylonitrile film panel and a peelable adhesive subsequently applied thereto;

applying said peelable adhesive to one of said first and second package panels in a predesignated peelable seal area; and

adhering said first and second package panels to each other, such that when said package is opened by separating the panels, said adhesive peels away from the package panel that had undergone said subjecting step without stringing of the adhesive applied during said applying step, and substantially all of said adhesive remains substantially adhered to the panel that had not undergone said subjecting step.

18. A hermetically peelable sealed structure enclosing a product, the structure being formed from a first packaging film and a second packaging film, each packaging film having a sealing surface, the first packaging film being a polyacryloni-

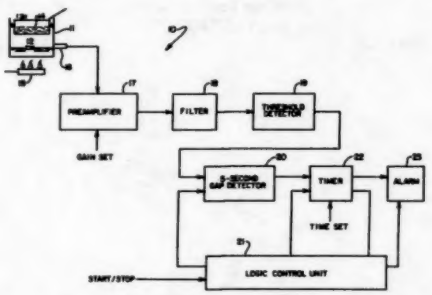
trile film, the sealing surface of said first packaging film having been subjected to a corona discharge to increase the surface tension thereof, an adhesive layer disposed between the respective sealing interfaces of said first and second packaging films, the bond strength of said adhesive layer between said first and second packaging films being substantially reduced by virtue of said corona discharge treatment of aid first packaging film, such that, when said sealed structure is opened, said adhesive layer uniformly peels away from said first packaging film treated surface, without stringing, while remaining substantially adhered to said second packaging film sealing surface.

5,180,600

METHOD FOR DEEP-FAT FRYING FOOD PRODUCTS

Paonan Hsieh, Worthington; William T. McComis, Worthington; Nagabhusan Senapati, Worthington; Foster B. Stulen, and Darrell D. Paul, both of Columbus, all of Ohio, assignors to Gas Research Institute, Chicago, Ill.

Filed Mar. 25, 1991, Ser. No. 674,208
Int. Cl.[5] A23L *1/00*
U.S. Cl. 426—233 **6 Claims**



1. A method of indicating the doneness of a food product immersed and cooked in a heated liquid oil medium comprising, the steps of;

a) detecting acoustic activity occurring in the heated liquid medium and generating a correlated output electrical signal;

b) detecting the amplitude of said correlated output electrical signal and generating a first control signal indicative of the correlated output signal having fallen below a predetermined threshold amplitude level continuously throughout a predetermined first period of time; and

c) generating a second control signal at a predetermined second period of time following the generation of said first control signal,

said second control signal being correlated to the doneness of the food product.

5,180,601

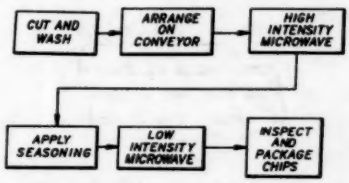
PROCESS FOR PREPARING FAT FREE SNACK CHIPS

David Gaon, San Jose, Calif., and John Wiedersatz, Jeffersonville, Ind., assignors to TGTBT, Ltd., Santa Barbara, Calif.

Filed Jun. 7, 1991, Ser. No. 712,196
Int. Cl.[5] A23L *1/00*; H05B *6/00*
U.S. Cl. 426—242 **16 Claims**

1. A process for making low fat chips from raw product slices, comprising the steps of:

a cooking step including exposing the slices to a microwave field having sufficiently high intensity to puff the slices



and increase the porosity of the exterior surfaces of the slices; and

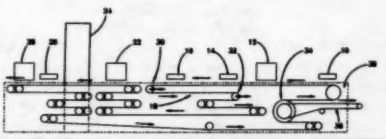
drying the slices.

5,180,602

METHOD AND APPARATUS FOR CONTROLLED MOLDING OF CHOCOLATE SHELL GOODS AND THE LIKE

Ross S. Bainbridge, Wyoming, Mich., and Gordon Steels, Petersborough, England, assignors to APV Baker Inc., Grand Rapids, Mich.

Filed Aug. 19, 1991, Ser. No. 747,264
Int. Cl.[5] A23G *7/00*; B65G *47/00*
U.S. Cl. 426—515 **31 Claims**



29. A method of controlling the speed of turning a confectionery shell mold in an apparatus for making confections, the apparatus having a conveyor for conveying the mold through the apparatus and having means for depositing confection material into the mold, comprising the steps of:

turning the conveyor in a manner causing inversion of a mold containing said confection material to drain said material from the mold while leaving a layer of the material coating the mold to form a confectionery shell;

reversing the conveyor to return the mold to an upright position after said turning and during the course of travel of the conveyor; and

moving the location where said turning occurs between a first position and a second position upstream along the direction of travel of the conveyor with respect to said first position when the conveyor has conveyed the mold to a location near said first position and the conveyor is about to be turned to cause inversion and draining of said mold.

5,180,603

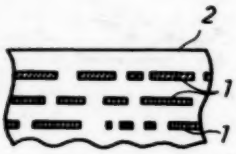
PROCESS FOR PRODUCING BAKERY PRODUCT HAVING LAYERED STRUCTURE

Iwao Moriya; Masayuki Sugie; Masayoshi Iwasaki, and Junichiro Sakata, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1991, Ser. No. 788,300
Claims priority, application Japan, Nov. 7, 1990, 2-301423
Int. Cl.[5] A21D *13/08*
U.S. Cl. 426—556 **4 Claims**

1. A process for producing a bakery product having a layered structure, which comprises combining dough and a roll-in fat which has a good spreadability at a temperature of 10° C. or

above and rapidly hardens at a temperature lower than 10° C., said combining being performed at a temperature of 10° C. or



above, and sheeting said combined dough and fat at a dough temperature lower than 10° C.

5,180,604

NON-FAT CREAM CHEESE PRODUCT AND METHOD FOR MANUFACTURE THEREOF

Lori A. Crane, Buffalo Grove; John T. Hynes, Glenview; Jules H. Guth, Mount Prospect, and John J. Strandholm, Morton Grove, all of Ill., assignors to Kraft General Foods, Inc., Northfield, Ill.

Filed Jul. 30, 1991, Ser. No. 737,664

The portion of the term of this patent subsequent to Jan. 7, 2009, has been disclaimed.

Int. Cl.[5] A23C *19/076*

U.S. Cl. 426—582 **4 Claims**

1. A method for making a non-fat cream cheese product comprising

introducing a cultured skim milk retentate having a pH of from about 4.8 to about 5.2 into a mixing tank provided with agitation means,

adding an emulsifying salt and optionally adding dry cottage cheese curd to said mixing tank and agitating said retentate for a first predetermined time period of from about 1 to about 5 minutes to provide a dispersion,

agitating said dispersion and recirculating said dispersion through a recirculating loop while injecting steam into said dispersion,

adding non-fat dry milk to said mixing tank at a first predetermined temperature of from about 70° F. to about 150° F., adding xanthan gum as the first gum of a gum system to said mixing tank at a second predetermined temperature of from about 140° F. to about 165° F.,

heating said dispersion to a third predetermined temperature of from about 165° F. to about 190° F. and stopping said steam injection,

adding salt, sugar and carrageenan, as the second gum of said gum system, to said mixing tank,

continuing said agitation for a second predetermined time period of from about 1 to about 5 minutes,

homogenizing said non-fat cream cheese mix to provide a non-fat cream cheese product,

said xanthan gum being present at a level of from about 0.2% to about 0.4%, said carrageenan being present at a level of from about 0.05% to about 0.3% and the ratio of the level of use of the xanthan gum to the level of use of carrageenan is in the range of from about 1.5:1 to about 4:1 by weight, said skim milk retentate being present at a level of from about 40% to about 80%, said dry curd cottage cheese being present at a level of from 0% to about 50%, said emulsifying salt being present at a level of from about 0.8% to about 1.2%, said non-fat dry milk being present at a level of from about 0.4% to about 0.8% and said sugar being present at a level of from about 0.7% to about 1.1%.

5,180,605

GLOVES, THEIR MANUFACTURE AND USE

Richard Milner, Bishops Stortford, United Kingdom, assignor to Smith & Nephew p.l.c., United Kingdom

Division of Ser. No. 341,946, Apr. 20, 1989, Pat. No. 5,031,245. This application Apr. 16, 1991, Ser. No. 686,177

Claims priority, application Japan, Apr. 23, 1988, 63-8809660; Apr. 23, 1988, 63-8809661; Apr. 25, 1988, 63-8809709

Int. Cl.[5] A01N *1/02*

U.S. Cl. 427—2 **5 Claims**

1. A method for the manufacture of an antimicrobial medical natural rubber glove, which comprises incorporating an antimicrobially effective amount of 2,4,4'-trichloro-2'-hydroxydiphenyl ether into the glove material prior to forming the glove.

5,180,606

APPARATUS FOR APPLYING A CONTROLLED AMOUNT OF REAGENT TO A MICROSCOPE SLIDE OR THE LIKE

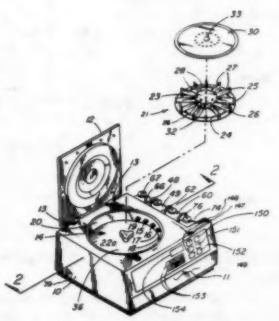
Barry O. Stokes, Logan; Gary D. Bradshaw, Wellsville, and Wayne K. Barlow, Providence, all of Utah, assignors to Wescor, Inc., Logan, Utah

Continuation-in-part of Ser. No. 350,106, May 9, 1989, Pat. No. 5,009,185. This application Apr. 23, 1991, Ser. No. 690,781

The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.

Int. Cl.[5] B05D *1/02*

U.S. Cl. 427—2 **15 Claims**



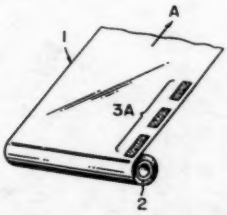
1. A method for gram staining bacterial specimens on slides using automatic staining equipment including carousel means for holding a plurality of slides having bacterial specimens thereon to be stained, means for rotating the carousel means at predetermined speeds in the spray chamber, and means for directing and controlling spray of reagents onto the slides and specimens during rotation of the carousel means, comprising directing a spray of crystal violet reagent onto the slides in the carousel in the spray chamber so as to saturate the bacterial specimens on the slides with crystal violet reagent; directing a spray of water onto the slides in the carousel in the spray chamber to rinse crystal violet reagent from the slides; directing a spray of iodine reagent onto the slides in the carousel in the spray chamber so as to saturate the bacterial specimen on the slides with iodine reagent; directing a spray of water onto the slides in the carousel in the spray chamber to rinse iodine reagent from the slides; directing a spray of a mixture reagent which is a mixture of decolorization solvent and counterstain onto the slides in the carousel int eh spray chamber and accurately controlling the amount of mixture reagent that is applied to the slides so that a desired amount of mixture reagent is accurately applied to each slide in the carousel; and directing a spray of water onto the slides in the carousel in the spray chamber so as to rinse the mixture reagent from the slides.

5,180,607

METHOD OF MANUFACTURING STRIPS OF THERMAL TRANSFER RECORDING SHEETS

Shigeki Umise, Kawaguchi, and Hirokatsu Imamura, Nerima, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Continuation of Ser. No. 614,212, Nov. 15, 1990, Pat. No. 5,109,795, which is a division of Ser. No. 265,679, Oct. 19, 1988, abandoned. This application Feb. 26, 1992, Ser. No. 841,513
Claims priority, application Japan, Feb. 23, 1987, 62-25204; Sep. 26, 1987, 62-239939
Int. Cl.[5] B41M *3/12*; B05D *3/12*
U.S. Cl. 427—8 6 Claims



1. A method of manufacturing strips of thermal transfer-type recording sheets, comprising the steps of:

supplying continuously a web of base film having a hot-melt ink layer on one surface thereof;

continuously feeding said web with a leading end thereof ahead along a path;

printing end marks by gravure printing process on either side of said web being fed along said path, at intervals in a direction transverse to the direction of feed of said web and only within regions of the web which are adjacent to said leading end and have a length in the direction of feed of the web; and

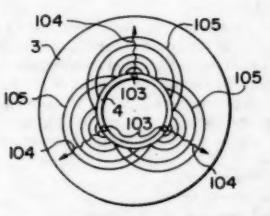
slitting said web in said direction of feed to separate the web into a plurality of narrow strips of recording sheet having said end marks printed respectively on the narrow strips of recording sheet having said end marks printed respectively on the narrow strips.

5,180,608

PROCESS FOR PRODUCING A RIGID MAGNETIC DISK BY LONGITUDINALLY GENERATING STANDING WAVES OR INTERFERENCE WAVES IN AN UNDRIED APPLIED MAGNETIC PAINT

Katsuyoshi Chiba, Hachioji; Masayuki Katsumoto, Kodaira; Yasutaro Uesaka, Kokubunji; Hajime Fukke, Tama; Heigo Ishihara, Tokyo; Iwao Matsuyama, Sagamihara; Naoki Kodama, Tachikawa; Hitoshi Inoue, and Yoshiharu Terada, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 489,500, Mar. 7, 1990, abandoned. This application Oct. 24, 1990, Ser. No. 604,380
Claims priority, application Japan, Mar. 9, 1989, 1-55007
Int. Cl.[5] G11B *5/00*; B05D *5/00*
U.S. Cl. 427—560 14 Claims



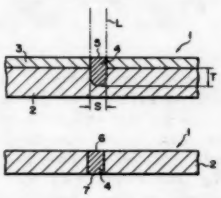
1. A process for producing a rigid magnetic disk, which comprises applying a magnetic paint containing at least magnetic powders in a dispersion state in a macromolecular binder to a non-magnetic disk substrate and then longitudinally orienting the magnetic powders by generating standing waves or interference waves in the applied magnetic paint while keeping the applied magnetic paint in an undried state, thereby forming a magnetic recording film on the non-magnetic substrate.

5,180,609

METHOD OF FORMING MODIFIED PORTION AND MAGNETIC RECORDING MEMBER USING THIS METHOD

Ei Nakamura, Yokosuka; Mitsuo Sasaki, Yokohama, and Hiromi Nakamura, Zama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Toshiba Machine Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 320,621, Mar. 8, 1989, Pat. No. 5,100,692. This application Oct. 4, 1991, Ser. No. 770,893
Claims priority, application Japan, Mar. 9, 1988, 63-55366
Int. Cl.[5] B05D *3/06, 5/12*; B44C *1/22*; H01L *21/306*
U.S. Cl. 427—595 2 Claims



1. A method of forming a magnetically modified portion, comprising the steps of:

preparing a member which comprises a plurality of layers having different compositions disposed between opposed first and second surfaces;

selectively radiating, via said first surface of said member, a high-energy beam onto said member so as to fuse at least two layers, thereby forming a fused portion in said member;

forming a first new surface of said member by removing from said member said first surface to a depth at least as great as the thickness of one of said two layers, wherein after said removing there remains at said first new surface a layer including a remaining fused portion corresponding to a magnetically modified portion made of a magnetic material having a lower permeability than that of a non-fused portion at said new surface of said member; and

forming a second new surface by removing said second surface a sufficient depth so that said remaining fused portion extends through the member from the first new surface to the second new surface.

5,180,610

METHOD FOR MANUFACTURING A LUMINESCENT STORAGE SCREEN HAVING A PHOPHOR WHICH IS TRANSPARENT TO READ-OUT RADIATION

Gerhard Brandner, Zirndorf, and Tanja Wegerer, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Division of Ser. No. 419,784, Oct. 11, 1989, abandoned. This application Feb. 12, 1991, Ser. No. 653,950
Claims priority, application European Pat. Off., Nov. 15, 1988, 88119043.3
Int. Cl.[5] B05D *5/06*
U.S. Cl. 427—64 7 Claims

1. A method for manufacturing a transparent stimulable phosphor for use in a luminescent storage screen comprising the steps of:

vapor-depositing a stimulable phosphor in a high vacuum on a carrier; and

re-tempering the vapor-deposited stimulable phosphor under a protective gas atmosphere up to a temperature slightly less than the melting point of the stimulable phosphor.

5,180,611

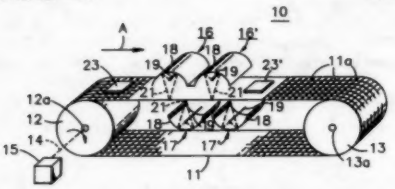
METHOD FOR IRRADIATION OF PRINTED WIRING BOARDS AND THE LIKE

Bernard J. Costello, Princeton, N.J., assignor to Argus International, Hopewell, N.J.

Division of Ser. No. 554,272, Jul. 18, 1990, Pat. No. 5,040,236. This application Apr. 19, 1991, Ser. No. 687,557

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—96 **8 Claims**



1. A method for treating printed wiring boards and the like having first and second major surfaces which printed wiring boards have at least one of their major surfaces provided with a liquid component placed thereon and overlayed by a solder mask film said method comprising the steps of:

conveying the printed wiring board upon an open mesh conveyor belt having projections thereon for supporting the printed wiring board a spaced distance above said conveyor belt to reduce the surface contact between the conveyor belt and the printed wiring board;

positioning a first group of ultraviolet sources capable of generating both ultraviolet and infrared energy radiation above and below the conveyor belt;

enabling the ultraviolet radiation from said sources to impinge upon the major surfaces of the printed wiring board supported on said conveyor belt to partially cure said liquid component while preventing an amount of the infrared energy from reaching the surfaces of said printed wiring board sufficient to mitigate induced shock and/or thermal expansion;

said radiant energy imparted to the liquid component being maintained at a level which preventing the liquid component from expanding to cause bulging and/or cracking of the solder mask film while enabling the liquid component to experience polymerization;

thereafter conveying the printed wiring board having the partially cured liquid component through a second irradiation location having a second group of ultraviolet sources for generating both ultraviolet and infrared radiation arranged above and below the conveyor belt; and

irradiating both major surfaces of the printed wiring board with both ultraviolet and infrared radiant energy to fully cure said liquid component and said solder mask film so that said liquid component is substantially fully polymerized and becomes solid and one with the overlying film.

5,180,612

APPARATUS AND METHOD FOR PROGRESSIVELY COATING A CYLINDER

Michael P. Rendell, Dorking, England, assignor to Komori Currency Technology UK Ltd., Dorking, England

Filed May 28, 1991, Ser. No. 706,224

Claims priority, application United Kingdom, May 31, 1990, 9012138

Int. Cl.[5] B05D *1/28*; B05C *1/08*

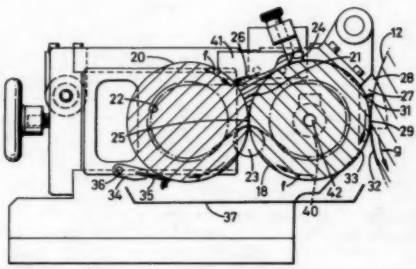
U.S. Cl. 427—372.2 **6 Claims**

1. A method of progressively coating a cylinder to increase its diameter, with layers of a fluid material which hardens to a resilient coating, comprising the steps of:

a) providing a reservoir of the fluid material continuously defined by a nip between front and rear rollers;

b) rotating said front and rear rollers in the same rotational sense whereby the fluid material is caused to flow over said front roller to a surface of the cylinder;

c) horizontally moving said front and rear rollers translationally so that said front roller is maintained at a desired spacing from an existing surface of the cylinder, whereby the fluid material is transferred from said front roller to the cylinder surface;



d) rotating the cylinder in an opposite sense to rotation of said front and rear rollers; and

e) heating the cylinder to harden the applied coating as the cylinder rotates, whereby upon each rotation, a new hardened surface for being additionally coated is presented;

whereby fluid material that does not adhere to the cylinder surface is carried back to said reservoir by advancing around an underside of said front roller, being transferred to said rear roller at said nip and then passing around an underside and a far side of said rear roller until reaching said reservoir.

5,180,613

Patent Not Issued For This Number

5,180,614

SUPPLE SHEET, RESISTANT TO TEARING AND BURSTING, WITH POOR LIQUID-ABSORBING POWER AND CONTROLLED POROSITY

Jean-Yves Escabasse, Charavines, France, assignor to Arjomari Europe, Paris, France

Filed Jan. 24, 1990, Ser. No. 469,391

Claims priority, application France, Dec. 22, 1989, 89 17147

Int. Cl.[5] B29D *22/00*

U.S. Cl. 428—34.2 **7 Claims**

1. A supple biodegradable sheet, resistant to tearing and bursting, with poor water or other liquid-absorbing power, having a controlled porosity, namely pores with regular diameters, large enough to allow the passage of gas molecules, yet small enough to prevent the passage of microorganisms and being printable and having homogeneous physical characteristics in the crosswise and lengthwise directions, wherein said sheet comprises:

at least cellulosic fibers,

optionally synthetic fibers,

optionally a moisture-resisting agent;

at least one binder,

at least one moisture-retaining agent in a proportion less than about 20% by dry weight of the sheet,

at least one sizing agent,

wherein the sheet has a COBB sizing value which is less than 20 g/m^2 and the TABER stiffness is less than 2.5.

5,180,615

METALLIZED BAG FOR STATIC PROTECTION OF ELECTRONIC COMPONENTS

Marvin R. Havens, Greer, S.C., assignor to W.R. Grace & Co.-Conn., Duncan, S.C.

Filed Dec. 13, 1989, Ser. No. 450,646

Int. Cl.^{5} B65D *73/02*

U.S. Cl. 428—35.3 12 Claims

1. A flexible sheet material adaptable for forming a package, bag, or envelope for receiving an electrostatically sensitive item, said sheet material having outer and inner surfaces, comprising an aluminum metallic layer bonded to an antistatic polymeric layer, said antistatic layer defining the inner surface of the package, bag, or envelope, said outside aluminum metallic surface, due to the presence of Al_2O_3 on said outside aluminum metallic surface, providing a high non-conductive surface resistivity no less than about 10^8 ohms/square at ambient conditions of about room temperature and 40 to 60% relative humidity, whereby said aluminum metallic layer and said antistatic layer in combination will provide static protection for the electrostatically sensitive item as determined by a capacitive probe test of discharging 1000 volts direct current onto the outer surface, by preventing the voltage from capacitively coupling to the electrostatically sensitive item.

5,180,616

HARD DISK MAGNETIC RECORDING MEDIUM COMPRISING MAGNETIC POWDER AND A BINDER AND HAVING A SPECIFIED MAGNETIC LAYER THICKNESS AND SURFACE ROUGHNESS

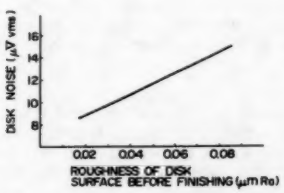
Hajime Fukke, Tama; Motoo Akagi, Tokyo; Iwao Matsuyama, Sagamihara; Masayuki Katsumoto, Kodaira; Hitoshi Inoue, Kokubunji; Naoki Kodama, Tachikawa, and Yasutaro Uesaka, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 64,569, Jun. 22, 1987, abandoned. This application Jan. 3, 1989, Ser. No. 293,177

Claims priority, application Japan, Jun. 23, 1986, 61-144935; Nov. 14, 1986, 61-269652; Jan. 27, 1988, 63-14441; Sep. 28, 1988, 63-241101

Int. Cl.^{5} G11B *05/00*

U.S. Cl. 428—64 1 Claim



1. A magnetic recording hard disk which comprises a non-magnetic substrate and a magnetic coating film comprising magnetic powder and a binder and having a film thickness of 0.02 μm to 0.2 μm and a surface roughness of not more than 0.014 μm Ra, provided on the non-magnetic substrate, the magnetic coating film being free from surface finishing for making the film thinner.

5,180,617

INTERIOR FINISHING PANEL FOR A VEHICLE AND A METHOD FOR PRODUCING THE SAME

Yasuo Takeuchi; Mutsuo Fujii, and Hideo Soejima, all of Hiroshima, Japan, assignors to Nishikawa Kaisei Co., Ltd., Hiroshima, Japan

Filed May 6, 1992, Ser. No. 879,196

Claims priority, application Japan, Jul. 31, 1991, 3-191572; Aug. 29, 1991, 3-218323

Int. Cl.^{5} B32B *3/02*

U.S. Cl. 428—71 5 Claims

2. An interior finishing panel with a convex section used for a vehicle which comprises a foam base material, a mat-shaped fiber reinforcing material and a facing material, said mat-shaped fiber reinforcing material being inserted into said foam base material which is molded integrally on a back side of said facing material,

wherein an impregnated sheet material, into which a molding material used for molding said foam base material is impregnated during a molding process, is inserted integrally between said facing material and said fiber reinforcing material at said convex section.

5,180,618

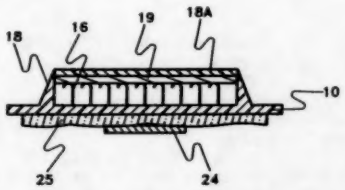
SEPARABLE FASTENERS FOR ATTACHMENT TO OTHER OBJECTS

William F. Kessler, Clarkston; Dennis R. Clutch, Rochester, both of Mich., and William J. Kennedy, Manchester, N.H., assignors to Velcro Industries B.V., Netherlands

Continuation-in-part of Ser. No. 470,128, Jan. 25, 1990, Pat. No. 5,061,540. This application Jul. 26, 1991, Ser. No. 736,093

Int. Cl.^{5} A44B *21/00*

U.S. Cl. 428—100 9 Claims



1. In a strip of fastener material adapted for securing to the surface of a foam bun during molding, wherein the fastener strip carries on a first surface an area of outwardly extending elements constituting one half of a touch fastening system, and wherein said first surface is arranged to be positioned so that it faces into a trough in a mold wall, wherein the strip of material is molded and carries on said first surface a pair of integrally formed elongated flexible sealing lips having a predetermined height adjacent to the edges of said area, and magnetizable means are carried by the strip, the fastening elements being

integrally formed hooks, a foam engaging portion of a second surface of the strip is adapted to be embedded in the foam;

the improvement wherein a removable sealing layer covers the ends of said hooks and extends completely between said lips, said lips being free of said sealing layer, the combined thickness of the sealing layer and the hooks being less than the height of the lips.

5,180,619

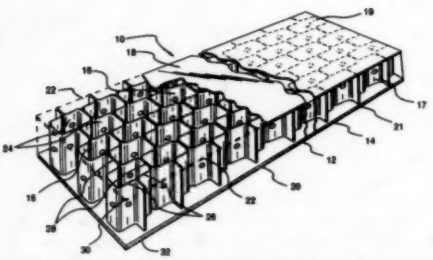
PERFORATED HONEYCOMB

Curtis L. Landi, and Susan L. Wilson, both of Sunnyvale, Calif., assignors to Supracor Systems, Inc., Calif.

Continuation-in-part of Ser. No. 446,320, Dec. 4, 1989, Pat. No. 5,039,567. This application Jun. 19, 1991, Ser. No. 717,523

Int. Cl.[5] B32B *3/12*

U.S. Cl. 428—116 **9 Claims**



1. A honeycomb panel having anisotropic flexing characteristics for dampening or dissipating pressure forces or waves, comprising:

a honeycomb core formed of undulated strips of resilient, thermoplastic material, thermal compression bonded together to form cell walls defining a plurality of contiguous regularly shaped cells, the walls of which have a plurality of perforations;

a first facing sheet of said resilient thermoplastic material, thermal compression bonded to an upper surface of said core formed by the upper extremities of said cell walls, the bonding being accomplished by simultaneously applying heat and pressure to the joinder of said first facing sheet and said core; and

a second facing sheet of said resilient thermoplastic material, thermal compression bonded to a lower surface of said core formed by the lower extremities of said cell walls, the bonding being accomplished by simultaneously applying heat and pressure to the joinder of said second facing sheet and said core.

5,180,620

NONWOVEN FABRIC COMPRISING MELTBLOWN FIBERS HAVING PROJECTIONS EXTENDING FROM THE FABRIC BASE

Takayuki Mende, Yamaguchi, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo and Uni-Charm Corporation, Kawanoe, both of, Japan

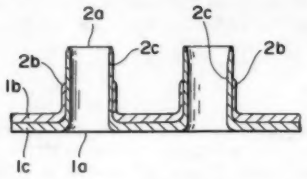
Filed Jul. 16, 1990, Ser. No. 552,462

Claims priority, application Japan, Jul. 18, 1989, 1-185569; Aug. 23, 1989, 1-216961; Sep. 11, 1989, 1-235370

Int. Cl.[5] B32B *3/10, 3/28;* **A61F** *13/15;* **D04H** *1/04*

U.S. Cl. 428—138 **18 Claims**

1. A nonwoven fabric which comprises melt-blown fibers comprising a base layer formed from the melt-blown fibers and having a number of holes, each of the holes having a peripheral edge and carrying a cylindrical projection standing from the peripheral edge, the cylindrical projection comprising the same fibers as those of the base layer, the height of the projections being at least twice as large as the thickness of the base layer, the projections being formed on only one side of the base layer, and a resin film layer being laid on the side of the base layer having cylindrical projections, whereby the projections



make the fabric appear and feel fluffy, light and soft as well as thick and provide shock absorbency to the fabric.

5,180,621

HEAT-SHRINKABLE ENVELOPE HAVING A TEAR-RESISTANT REINFORCING COMPONENT

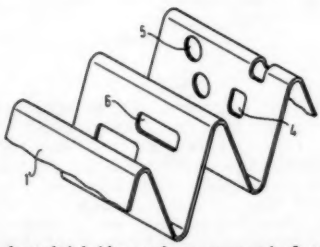
Manfred Heier, Herdecke; Uwe Brudermann, Heikendorf, and Christian Kipfelsberger, Hepberg, all of Fed. Rep. of Germany, assignors to RXS Schrumpftechnik-Garnituren GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 586,872, Sep. 24, 1990, abandoned. This application May 21, 1992, Ser. No. 888,467

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1989, 3935045

Int. Cl.[5] B32M *3/24;* **B29C** *61/00*

U.S. Cl. 428—138 **15 Claims**



1. In a heat-shrinkable envelope composed of at least one heat-shrinkable component having a mechanically reinforcing component, the improvements comprising the mechanical reinforcing component having a plurality of planar surfaces joined in a continuous undulating configuration and being embedded in the shrinkable component, said reinforcing component being constructed to enable both dilation and shrink motions non-destructively along both dilation and shrink directions, said undulations extending parallel to each other, and the reinforcing component having means for stopping tears in the reinforcing component formed by irregularly located beads, punctures, slots, or holes in the reinforcing component.

5,180,622

ABSORBENT MEMBERS CONTAINING INTERPARTICLE CROSSLINKED AGGREGATES

Charles J. Berg; Donald C. Roe, and Frank H. Lahrman, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

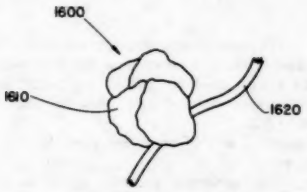
Filed Apr. 2, 1990, Ser. No. 503,500

Int. Cl.[5] B32B *23/02*

U.S. Cl. 428—192 **32 Claims**

1. An absorbent member comprising a mixture of fiber material and a particulate, absorbent, polymeric composition, said polymeric composition comprising interparticle crosslinked aggregates, said interparticle crosslinked aggregates compris-

ing (i) precursor particles of substantially water-insoluble, absorbent, hydrogel-forming, polymer material, and (ii) an interparticle crosslinking agent reacted with said polymer material of said precursor particles to form covalent crosslink



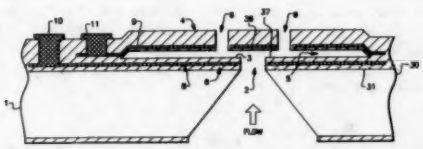
bonds between said precursor particles, said interparticle crosslinked aggregates being present in said polymeric composition in an amount such that said polymeric composition has a mass average particle size at least about 25% greater than the mass average particle size of said precursor particles.

5,180,623

ELECTRONIC MICROVALVE APPARATUS AND FABRICATION

Thomas R. Ohnstein, Roseville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 457,452, Dec. 27, 1989, Pat. No. 5,082,242. This application Jan. 2, 1991, Ser. No. 636,965
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—209 **6 Claims**



1. An intermediate structure formed in the fabrication process of an electrostatic miniature valve comprising:

a single crystal (100) silicon wafer having a planar surface;

a thin film layer of silicon nitride on the silicon surface;

a first thin film metallic electrode on and covering a portion of said silicon nitride;

a second thin film layer of silicon nitride over said thin film metallic electrode;

a sacrificial thin film layer of selectively etchable material, said sacrificial layer being deposited on said second silicon nitride layer to define a closure valve plate location;

a third thin film layer of silicon nitride on the selectively etchable material layer and any of the nitride covered silicon surface which remains exposed;

a second thin film metallic electrode over said third thin film layer of silicon nitride and positioned at a location generally overlaying said first electrode; and

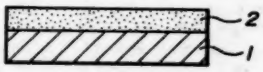
a fourth thin film cover layer of silicon nitride on the second electrode and the remainder of the nitride covered silicon surface.

5,180,624

INK JET RECORDING PAPER

Yutaka Kojima, and Takashi Omori, both of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 410,465, Sep. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 246,684, Sep. 20, 1988, Pat. No. 4,877,978. This application May 14, 1991, Ser. No. 699,643
Claims priority, application Japan, Sep. 21, 1987, 2-36692
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—211 **15 Claims**



1. An ink jet recording paper comprising

a paper layer that contains an internal sizing agent, and

an ink-receptive layer comprising a material having good affinity for inks and consisting of pulp other than synthetic pulp, filler, and at least one substance selected from the group consisting of

starch, polyvinylalcohol, gelatin, sodium alginate, hydroxyethylcellulose, carboxymethylcellulose, polyacrylamide, polystyrene sulfonate, polyacrylate, polydimethyldiallylammonium chloride, polyvinylbenzyltrimethylammonium chloride, polyvinylpyridine, polyvinylpyrrolidone, polyethyleneoxide, hydrolysis product of starch-acrylonitrile graftpolymer, polyethyleneimine, polyalkylene-polyaminedicyandiamideammonium condensate, polyvinylpyridinium halide, poly-(meth)acrylalkyl quaternary salts, poly-(meth)acrylamidealkyl quaternary salts, vegetable gum, colloidal animal glue, aluminum sulfate, styrene-acrylic resin, polyethylene-imine quaternary salt, epichlorohydrin resin, polyamide epichlorohydrin resin, formalin resin carboxylated polyacrylamide, partially aminated polyacrylamide, acid addition compound of partially aminomethylated polyacrylamide and acid addition compound of partially methylolated polyacrylamide,

wherein said paper layer has an opacity of 75% or over and a Stockigt sizing degree of 3 seconds or over, and,

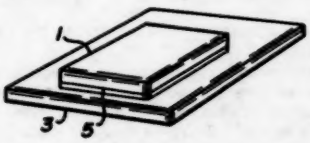
wherein said ink-receptive layer is superposed on either one or both sides of said paper layer by a multi-ply paper-manufacturing process.

5,180,625

CERAMIC ALUMINUM LAMINATE AND THERMALLY CONDUCTIVE ADHESIVE THEREFOR

Mansheng Wang, and Bruce A. Given, both of San Diego, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 189,859, May 3, 1989, abandoned. This application Jun. 21, 1990, Ser. No. 541,663
Int. Cl.[5] B32B *7/12*
U.S. Cl. 428—212 **5 Claims**



1. A reworkable silicone free heat sinked ceramic circuit board having a surface of an area of at least ten square inches and capable of withstanding temperature cycling in the range

of −60° C. to 125° C., vibration and humidity without delaminating, comprising:

a flat ceramic board having a surface of an area of at least ten square inches;

a flat aluminum sheet having a surface area sufficient in size and geometry to at least cover said surface of said ceramic circuit board;

an epoxy adhesive intermediate said board and said sheet;

said epoxy adhesive holding said board and said sheet together and forming therewith a laminate and said epoxy adhesive being of sufficient flexibility characteristic to prevent delamination due to thermal stress at all temperatures within the range of −60 degrees Centigrade and 125 degrees Centigrade and being thermally conductive for permitting transfer of heat between said ceramic board and said aluminum sheet and having a dielectric constant of at least 3 at 1 MHz with said epoxy adhesive having the characteristics as follows: Hardness, Shore A of at least 70; Volume Resistivity @ 75° F. (ohm-cm) of at least 3×10^{13}; Dielectric Strength (volts/mil) of at least 400; Dielectric Constant @ 1 MHz of at least 3.1; Thermal Conductivity (BTU-in/hr. ft.^{2} °F.) of at least 3; Coefficient of Thermal Expansion (per °F.) of not more than 73×10^{-6} and Young's Modulus, Tensile of at least 290,000.

5,180,626

OPAQUE AND PEARLESCENT, LAMINATED AND STRETCHED PRODUCTS, AND METHOD FOR MAKING THEM

Tadao Ishibashi, and Kazuhiro Yamada, both of Ichihara, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Sep. 14, 1990, Ser. No. 582,100

Claims priority, application Japan, Sep. 25, 1989, 1-246531

The portion of the term of this patent subsequent to Nov. 26, 2008, has been disclaimed.

Int. Cl.^{5} B32B *7/02*

U.S. Cl. 428—213 **5 Claims**

1. An opaque and pearlescent, laminated and stretched product comprising a layer (A) and a layer (B) overlaid on and laminated by melt-adhesion to at least one side of said layer (A), said layer (A) forming a uniform layer comprising 97 to 70% by weight of a crystalline polypropylene and 3 to 30% by weight of a cyclopentadiene derived petroleum resin having a softening point of 160° C. or higher and stretched in at least one direction, and said layer (B) comprising a crystalline polypropylene whose crystalline melting point is higher or lower than that of the crystalline polypropylene used for said layer (A) by less than 10° C.

5,180,627

HEAT RESISTANT ADHESIVE COMPOSITION

Hiroshi Inoue; Seiichirou Takabayashi; Tadao Muramatsu; Tsutomu Funagoshi, and Tetsuji Hirano, all of Osaka, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Dec. 2, 1991, Ser. No. 801,686

Claims priority, application Japan, Nov. 30, 1990, 2-330101; Nov. 30, 1990, 2-330102; Jul. 23, 1991, 3-273019; Jul. 26, 1991, 3-274459

Int. Cl.^{5} B32B *7/02;* **C08F** *283/10, 283/12*

U.S. Cl. 428—214 **7 Claims**

1. A heat resistant adhesive composition comprising

100 weight parts of a polyimidesiloxane obtained from a biphenyltetracarboxylic acid selected from the group consisting of 2,3,3',4'-biphenyltetracarboxylic acid, 3,3'4,4'-biphenyltetracarboxylic acid, dianhydrides of said acids and esters of said acids, and a diamine composition comprising a diaminopolysiloxane having the formula (I):

(I)

wherein R is a divalent hydrocarbon group, each of R^1, R^2, R^3 and R^4 independently is a lower alkyl group or phenyl group, and n is an integer of 3–60, and an aromatic diamine, said diaminopolysiloxane and aromatic diamine being used in a ratio of 2:8 to 8:2;

10–500 weight parts of an epoxy resin having an epoxy group; and

an epoxy resin-hardening agent in an amount of 0.01–60 weight parts per 100 weight parts of the epoxy compound.

5,180,628

SHOCK-ABSORBING PROPYLENE POLYMER COMPOSITE MOLDINGS

Udo Haardt, Biblis; Erhard Seiler, Ludwigshafen; Hermann Tatzel, Weinheim; Harald Schwager, Speyer, and Friedrich Domas, Altlussheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 17, 1992, Ser. No. 822,263

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1991, 4101806

Int. Cl.^{5} B32B *3/00, 3/18*

U.S. Cl. 428—215 **2 Claims**

1. A shock-absorbing propylene polymer composite molding containing

a. a layer with a thickness of from 0.5 to 10 mm which contains a propylene polymer having a melting point of from 130 to 165° C.,

b. an intermediate layer with a thickness of from 0.05 to 0.5 mm comprising a hot-melt adhesive based on an olefin copolymer having a melting point of from 90 to 140° C.,

c. a foam layer with a thickness of from 3 to 200 mm and a density of from 0.015 to 0.1 g/cm^3 based on a propylene copolymer having a melting point of from 125° to 155° C.,

d. an intermediate layer with a thickness of from 0.05 to 0.5 mm comprising a hot-melt adhesive based on an olefin copolymer having a melting point of from 90° to 140° C.,

e. a layer with a thickness of from 0.5 to 10 mm which contains a propylene polymer having a melting point of from 130° to 165° C.

5,180,629

INJECTION-MOLDED ARTICLE

Masahiro Terada; Nobuji Sugimoto; Toshiro Watanabe, all of Kanagawa, and Takashi Sugimoto, Mie, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Mitsubishi Petrochemical Co., Ltd., Tokyo, both of, Japan

Filed Jun. 27, 1991, Ser. No. 722,417

Claims priority, application Japan, Jun. 27, 1990, 2-166870

Int. Cl.^{5} C08L *23/10, 23/16, 53/00*

U.S. Cl. 428—220 **14 Claims**

1. An injection-molded article, formed of a material comprising:

(A) polypropylene in an amount ranging from 50 to 70 weight %, said polypropylene containing ethylene in an amount not more than 15 weight % relative to said polypropylene and having a MFR (at 230° C.) ranging from 5 to 60 g/10 min.;

(B) ethylene-propylene copolymer rubber polymerized in the presence of a vanadium-based catalyst, in an amount ranging from 5 to 30 weight %, said copolymer containing propylene in an amount ranging from 20 to 40 weight % relative to said ethylene-propylene copolymer rubber and

having a Mooney viscosity ML_{1+4}(100° C.) ranging from 20 to 80;

(C) ethylene-propylene copolymer rubber polymerized in the presence of a titanium-based catalyst, in an amount ranging from 5 to 45 weight %, said copolymer containing propylene in an amount ranging from 30 to 70 weight % relative to said ethylene-prolylene copolymer rubber and having a Mooney viscosity ML_{1+4}(100° C.) ranging from 20 to 75; and

(D) polyethylene in an amount not more than 10 weight %, said polyethylene having a MFR (at 190° C.) ranging from 5 to 50 g/10 min.,

wherein said injection-molded article has an average thickness ranging from 2 to 6 mm, a flexural elastic modulus ranging from 3000 to 6000 kg/cm^2, and a coefficient of linear expansion not higher than 8×10^{-5}/°C.

5,180,630
FIBRILLATED FIBERS AND ARTICLES MADE THEREFROM

Robert D. Giglia, Rye, N.Y., assignor to American Cyanamid Company, Me.
Division of Ser. No. 918,246, Oct. 14, 1986. This application Sep. 18, 1989, Ser. No. 408,587
Int. Cl.^{5} B32B *9/00, 19/00;* **D04H** *11/00*
U.S. Cl. 428—224 **19 Claims**

1. A non-woven fabric material comprising a wet-laid sheet containing a fibrillated, monoethylenically unsaturated monomer based fiber having a Canadian Standard Freeness of less than 100 in combination with a Tensile Strength of at least 5 pounds per inch.

5,180,631
SHEET MATERIAL AND PROCESS FOR PRODUCING THE SAME

Satoshi Amano, Tokyo, Japan, assignor to Nisshinbo Industries, Inc., Tokyo, Japan
Filed Apr. 8, 1991, Ser. No. 681,597
Claims priority, application Japan, Oct. 4, 1990, 2-95959
Int. Cl.^{5} B32B *5/24, 5/26, 27/02, 27/08;* **B65D** *53/00*
U.S. Cl. 428—236 **9 Claims**

1. A sheet material comprising a layer of a sheet-shaped material made of an inorganic filler other than asbestos, a rubber material and a polycarbodiimide pulp, and a layer of a reinforcing material treated with a polycarbodiimide resin.

5,180,632
ORTHOPEDIC CASTING MATERIAL HAVING REDUCED TACK AND REDUCED SLIP

Martin Edenbaum, Princeton Junction, N.J.; Kurt C. Frisch, Grosse Ile, Mich.; Aisa Sendijarevic, Troy, Mich., and Shaiowen Wong, Claire Shores, Mich., assignors to Carapace, Tulsa, Okla.
Filed Dec. 18, 1989, Ser. No. 452,217
The portion of the term of this patent subsequent to Oct. 29, 2008, has been disclaimed.
Int. Cl.^{5} A61L *15/14;* **A61F** *5/04, 13/04;* **B32B** *17/04*
U.S. Cl. 428—253 **17 Claims**

1. An orthopedic casting material comprising a fabric coated or impregnated with a combination of a reactive fluid water-curable polyisocyanate prepolymer and an effective detackifying quantity of one or more hydrophilic bisurethanes selected from the group consisting of compounds of the formulas I and II:

$$R(O)CNH-X-NHC(O)O-Y-O(O)CNH-X-NHC(O)R \quad (I)$$

$$Z-NHC(O)O-Y-O(O)CNH-Z \quad (II)$$

where Y is a hydrophilic polymeric chain having a molecular weight in the range of about 1000 to 8000; each X in formula I and each Z in formula II may be the same or different and is selected from aromatic, cycloaliphatic or aliphatic groups; and R is derived from monofunctional C1-C6 alcohols or from oxyalkylene adducts of monofunctional alcohols of the general formula IV:

$$H-O-(CH_2\overset{\overset{CH_3}{|}}{C}HO)_q(CH_2CH_2O)_mH \quad (IV)$$

where q and m are independently 0 or a positive integer, provided that if one of q or m is 0, the other of q or m is a positive integer.

5,180,633
COMPOSITE TEXTILE MATERIAL CAPABLE OF BEING EMPLOYED FOR RESIN REINFORCEMENT

André Fourezon, Ardéche, France, assignor to Establissements les Fils D'Auguste Comarat & Cie, France
Filed Dec. 14, 1990, Ser. No. 628,430
Claims priority, application France, Dec. 22, 1989, 89 17393
Int. Cl.^{5} B32B *3/06, 5/06, 5/22*
U.S. Cl. 428—300 **4 Claims**

1. A composite material having a planar, aerated structure, for use in the production of composite structures that includes:

a multi-layered structure consisting essentially of at least two superimposed woven yarn layers, one of said yarn layers being formed of non-twisted glass filaments and the other of said yarn layers being formed of non-twisted strands selected from the group consisting of aramid and carbon fibers having a higher mechanical strength than the glass filaments; and

needling means for joining the two woven layers so that a portion of the strands of high mechanical strength are implanted within the glass filament yarn.

5,180,634
COEXTRUDED MULTILAYER AND A PROCESS FOR PREPARING THE SAME

Carlo Sempio, Busto Arsizio; Andrea Anghileri, Milan; Marc Binaghi, Milan; Tullo Ronchetti, Milan, and Italo Vailati, Castelanza, all of Italy, assignors to Elf Atochem Italia S.r.l., Milan, Italy
Filed Sep. 18, 1990, Ser. No. 584,282
Claims priority, application Italy, Sep. 18, 1989, 21750 A/89
Int. Cl.^{5} B32B *27/00*
U.S. Cl. 428—336 **12 Claims**

1. Multilayer coextruded sheets comprising:

a) a first outer layer consisting of a blend containing 40–70% by weight of polyvinylidene fluoride having an average molecular weight (Mw) not higher than 250.000, 30–60% by weight of a homo or copolymer of an alkylmethacrylate and 10–30% by weight, with respect to the sum of the preceding components, of an elastomer in the grafted form;

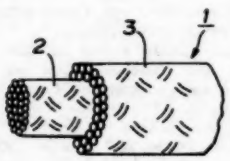
b) at least a layer of a homo or copolymers of an alkyl=methacrylate admixture with 5–40% by weight of an elastomer in the grafted form; and

c) optionally at least an intermediate layer between (a) and (b) of a homo or copolymer of an alkylmethacrylate.

5,180,635
HIGH PERFORMANCE PRESSURE SENSITIVE ADHESIVE TAPES
Sebastian S. Plamthottam, Upland, and Yehuda Ozari, Arcadia, both of, assignors to Avery Dennison Corporation, Pasadena, Calif.
Continuation of Ser. No. 333,135, Apr. 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 209,896, Jun. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 69,376, Jul. 1, 1987, abandoned. This application Oct. 26, 1990, Ser. No. 604,363
Int. Cl.[5] B32B *7/12*
U.S. Cl. 428—345 4 Claims

1. An electron beam cured pressure sensitive adhesive tape having:
a carrier layer prepared from a composition comprising a rubber-based black copolymer matrix and a polythiol crosslinking agent and from about 5% to about 70% by volume low density microspheres; and
a skin layer on at least one side of the carrier layer, said skin layer comprising a rubber-based adhesive block copolymer matrix and a polythiol cross-linking agent;
wherein said pressure sensitive adhesive tape has a peel adhesion of from about 4000 to 12,000 Newtons/meter and a shear adhesion failure temperature of at least about 90° C.

5,180,636
ROPE FOR TRACTION
Hirofumi Harazoe, Kugagun; Hiroyoshi Shiromoto, Iwakuni; Kazuo Yagi, Ootake, and Masahiro Kouya, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan
Continuation of Ser. No. 241,870, Sep. 8, 1988, abandoned. This application Apr. 2, 1991, Ser. No. 680,616
Claims priority, application Japan, Sep. 8, 1987, 62-225652; Apr. 4, 1988, 63-82502
Int. Cl.[5] D02G *3/00*
U.S. Cl. 428—373 4 Claims

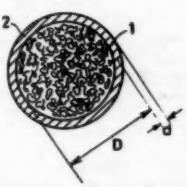


1. A rope for traction of a double structure of a core member coated with a sheath member, in which said core member comprises a molecularly oriented shaped article of an ultrahigh molecular weight copolymer of ethylene and at least one alpha-olefin having from 3 to 20 carbon atoms wherein said copolymer of ethylene and at least one alpha-olefin contains from 0.1 to 20 moles of copolymerized alpha-olefin on average per 1000 carbon atoms of said copolymer and has an intrinsic viscosity of at least 5 dl/g, and said sheath member comprises a braid.

5,180,637
DOUBLE-WALLED MICROCAPSULES AND A PROCESS FOR PREPARATION OF SAME
Masaaki Sumii, Sakai, Japan, assignor to Sakura Color Products Corporation, Japan
Filed Oct. 29, 1991, Ser. No. 784,521
Claims priority, application Japan, Nov. 2, 1990, 2-298397
Int. Cl.[5] B01J *13/10, 13/18, 13/20*
U.S. Cl. 428—402.21 4 Claims

1. Double-walled microcapsules each having a core of a hydrophobic substance, and a primary wall and a secondary wall formed therearound, the microcapsules being characterized in that the primary wall is composed of an amino resin prepared by polycondensation reaction of at least one member selected from the group consisting of:
(1) urea and formaldehyde,
(2) a methylolurea monomer or a low molecular weight polymer thereof, and
(3) a methylated methylolurea monomer or a low molecular weight polymer thereof,
and that the secondary wall is formed from a polyion complex of a cationic polyamide-epihalohydrin resin having a urea bond in the structural unit with a polystyrenesulfonic acid and/or a salt thereof.

5,180,638
METHOD FOR REDUCING THE LEACHABILITY OF GRANULAR MATERIAL AND GRANULAR MATERIAL OBTAINED USING THIS METHOD
Gertjan A. O. Teekman, Harderwijk, Netherlands, assignor to Aardelite Holding B.V., Nijkerk, Netherlands
Filed Dec. 12, 1990, Ser. No. 626,017
Claims priority, application Netherlands, Dec. 18, 1989, 8903092
Int. Cl.[5] B32B *9/04*
U.S. Cl. 428—407 5 Claims



5. A coated granular material having reduced leachability, comprising granular material consisting essentially of an inorganic binder and a filler containing contaminants, individual particles of the granular material having thereon a closed coating of a water-insoluble and water-repellent polymer composition such that the contaminants in the filler cannot be reached by water.

5,180,639
METHOD OF PREPARING POLYMER SURFACES FOR SUBSEQUENT PLATING THEREON AND IMPROVED METAL-PLATED PLASTIC ARTICLES MADE THEREFROM
Kenneth P. Zarnoch, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Continuation-in-part of Ser. No. 603,648, Oct. 26, 1990. This application Aug. 12, 1991, Ser. No. 744,043
Int. Cl.[5] B32B *27/36*
U.S. Cl. 428—412 21 Claims

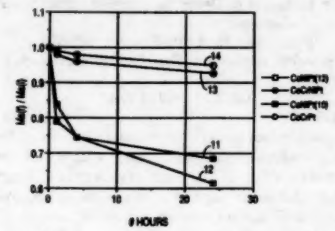
11. A method of metallizing a surface of an aromatic polymer substrate comprises:
nitration of polymer molecules disposed on said surface;
ammonolytic cleavage of nitrated polymer molecules; and
application a metal layer on said surface.

5,180,640

MAGNETIC RECORDING MEDIUM COMPRISING A MAGNETIC ALLOY LAYER OF COBALT NICKEL, PLATINUM AND CHROMIUM FORMED DIRECTLY ON A NICKEL ALLOY AMORPHOUS UNDERLAYER

Tsutomu T. Yamashita, San Jose; Phuong Nguyen, Milpitas, and Tu Chen, Monte Sereno, all of Calif., assignors to Komag, Inc., Milpitas, Calif.

Filed Oct. 1, 1990, Ser. No. 590,885
Int. Cl.[5] G11B 5/00
U.S. Cl. 428—611 26 Claims



1. A magnetic thin film recording medium for horizontal recording comprising:

a substrate;

an amorphous of substantially amorphous metallic thin film undercoat formed on said substrate;

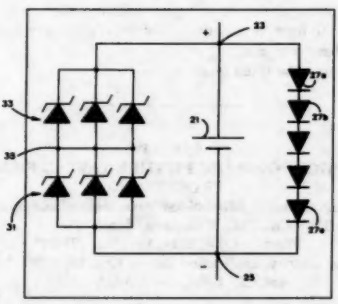
a magnetic layer formed directly on the undercoat by vacuum deposition, said magnetic layer being an alloy comprising cobalt, nickel, chromium and platinum, the platinum concentration being from about 8 to 15 atomic percent, the nickel concentration being about 5 to 10 atomic percent, the chromium concentration being from about 3 to 8 atomic percent and the balance comprising cobalt, the cobalt concentration being greater than or equal to about 75 atomic percent.

5,180,641

BATTERY CELL BYPASS CIRCUIT

James R. Burns, Laguna Beach, and Marvin F. Blaski, Whittier, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed May 9, 1991, Ser. No. 697,388
Int. Cl.[5] H01M 2/34
U.S. Cl. 429—1 7 Claims



1. A battery cell circuit comprising:

a battery cell having a positive terminal and a negative terminal;

a first plurality of diodes connected in series between said positive terminal and said negative terminal, wherein said diodes are connected with their forward direction from said positive terminal to said negative terminal;

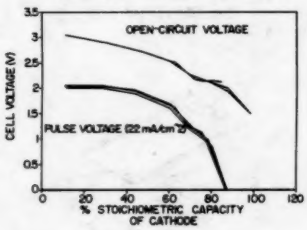
a second plurality of diodes connected in parallel with each other between said negative terminal and said positive terminal, wherein said diodes of said second plurality are connected with their forward direction from said negative terminal to said positive terminal.

5,180,642

ELECTROCHEMICAL CELLS WITH END-OF-SERVICE INDICATOR

Douglas J. Weiss, Plymouth; John W. Cretzmeyer, Richfield; Ann M. Crespi, Minneapolis; William G. Howard, Roseville, and Paul M. Skarstad, Plymouth, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 24, 1992, Ser. No. 840,224
Int. Cl.[5] H01M 6/14
U.S. Cl. 429—90 11 Claims



1. A non-aqueous cell comprising:

(a) an active metal anode;

(b) a liquid organic electrolyte; and

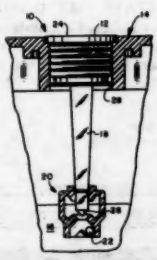
(c) a composite cathode, the composite cathode comprising a mixture of a first material selected from the group consisting of manganese dioxide, carbon monofluoride and mixtures thereof and a second material selected from the group consisting of V_6O_{13+y}, $\beta Ag_xV_2O_5$, $\delta Ag_xV_2O_5$, $Ag_2V_4O_{11}$, BiF_3 and TiS_2.

5,180,643

HYDROMETER COLLAR IMPROVEMENT

Ralph G. Nedbal, Saint Charles, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Dec. 16, 1991, Ser. No. 807,243
Int. Cl.[5] H01M 10/48
U.S. Cl. 429—91 20 Claims



1. An improved hydrometer collar for use in lead-acid storage batteries of the type installed within vehicles, comprising:

a cylindrically-shaped member having an annular side wall;

a plurality of sealing rings being formed upon the outer surface of said annular side wall, each one of said plurality of sealing rings being spaced axially apart from each other in a substantially parallel relationship so as to form annular

grooves therebetween and having an external peripheral surface; and

a small wiping rib being formed integrally with each one of said plurality of sealings rings and extending radially outwardly from said external peripheral surface of a respective one of said sealing rings;

each one of said wiping ribs being disposed substantially intermediate an upper surface and a lower surface of a corresponding one of said plurality of sealing rings.

whereby said wiping ribs are easily deformable so as to fill in any imperfections existing in the interior of a battery casing bore of said storage battery into which said collar is inserted thereby creating a fluid-type seal.

5,180,644

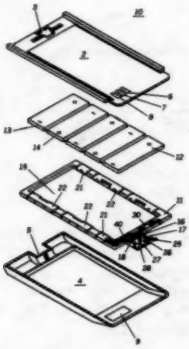
WELDLESS BATTERY PACK

Mark S. Bresin, Coral Springs; Adnan Aksoy, Boca Raton, and Michael Robinson, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 9, 1992, Ser. No. 848,465

Int. Cl.[5] H01M *2/10*

U.S. Cl. 429—98 **20 Claims**



1. A battery pack, comprising:

a housing;

a header frame, detachably mounted to the housing;

a plurality of cells for insertion into the header frame; and

circuitry means on the header for coupling the plurality of cells and providing charger and power contacts.

5,180,645

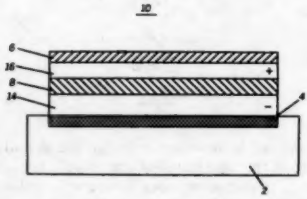
INTEGRAL SOLID STATE EMBEDDED POWER SUPPLY

Georgina Moré, Delray Beach, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 1, 1991, Ser. No. 662,598

Int. Cl.[5] H01M *2/22*

U.S. Cl. 429—127 **19 Claims**



1. A battery integrally formed in a substrate, comprising:

a first current collector embedded in said substrate and further coupled to a first electrode;

a second current collector coupled to a second electrode; and

a solid state electrolyte between said first electrode and said second electrode.

5,180,646

NICKEL-CADIUM STORAGE BATTERY WITH IMPROVED ELECTRICAL PROPERTIES

Gerhard Berger, Natternweg; Gabor Benczúr-Ürmössy, Stuttgart, and Klaus von Benda, Nürtingen, all of Fed. Rep. of Germany, assignors to Deutsche Automobilgesellschaft mbH, Fed. Rep. of Germany

Filed May 15, 1991, Ser. No. 700,398

Claims priority, application Fed. Rep. of Germany, May 15, 1990, 4015495

Int. Cl.[5] H01M *4/62*

U.S. Cl. 429—198 **15 Claims**

1. Nickel-cadmium storage battery with improved electrical properties, in which the active material with which the negative electrode is filled or the electrolyte contains copolymers of vinyl pyrrolidone as expander, one or more copolymers of vinyl pyrrolidone having a mean molecular weight of 10,000 g/mol to 100,000 g/mol and a vinyl pyrrolidone content of between 5 and 95 mol-%.

5,180,647

BATTERY SEPARATOR AND METHOD OF MAKING SAME

Bob G. Rowland; George E. Monigold, Jr., both of Corvallis; Robert L. Brendle, Sweet Home, and Francis V. Rosse, Corvallis, all of Oreg., assignors to Evanite Fiber Corporation, Corvallis, Oreg.

Continuation of Ser. No. 593,513, Oct. 2, 1990, abandoned, which is a continuation of Ser. No. 408,803, Sep. 18, 1989, abandoned. This application Sep. 19, 1991, Ser. No. 762,782

Int. Cl.[5] H01M *2/16*

U.S. Cl. 429—252 **4 Claims**

1. A method for manufacturing a separator for use in an electrolytic storage battery, comprising the steps:

(a) providing a fibrous mat;

(b) providing a liquid polymeric binder;

(c) providing a particulate filler;

(d) suspending the filler in the liquid binder to form a liquid filler mixture;

(e) applying the filler mixture to the fibrous mat to form a filled mat;

(f) providing a rib-forming material;

(g) applying the rib-forming material to a surface of the mat so as to form at least one rib of the rib-forming material on said surface: and

(h) drying the filled mat.

5,180,648

PHOTOGRAPHIC PICTURE-TAKING FILM PROCESSING

Takashi Nakamura, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 11, 1991, Ser. No. 775,097

Claims priority, application Japan, Oct. 19, 1990, 2-281557

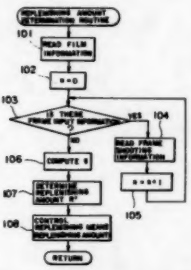
Int. Cl.[5] G03C *7/44, 5/31, 5/395*

U.S. Cl. 430—21 **7 Claims**

1. A method for processing a photographic picture-taking film having picture information born on itself or on a container for the film, comprising the steps of:

reading the picture information on the film itself or the container,

determining a processing condition on the basis of the read picture information, and



processing the film under the determined condition, wherein the processing condition is an amount of processing solution to be replenished.

5,180,649

TONER HAVING CROSSLINKAGES AND METHOD OF FIXING SAME

Tsutomu Kukimoto, Tokyo; Hiroshi Yusa; Tsuyoshi Takiguchi, both of Yokohama; Koichi Tomiyama, Kawasaki, and Tetsuhito Kuwashima, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1990, Ser. No. 611,096

Claims priority, application Japan, Nov. 9, 1989, 1-289881; Nov. 9, 1989, 1-291796

Int. Cl.[5] G03G *9/083, 13/20, 9/087, 9/097*

U.S. Cl. 430—106.6 **58 Claims**

1. A heat and pressure fixable toner for developing electrostatic images, comprising: a binder resin and a metal salt or a metal complex; wherein the toner has:

a dynamic modulus $G'_{120-200}$ at 120–200° C. of 2×10^3 or higher to below 5×10^5 [dyne/cm^2] as measured in the frequency range of 1×10^{-2}–1 (Hz);

a loss modulus $G''_{120-200}$ at 120–200° C. of 2×10^3 or higher to below 5×10^5 [dyne/cm^2] as measured in the frequency range of 1×10^{-2}–1 (Hz);

a dynamic modulus G'_{200} at 200° C. and a frequency f satisfying an approximated linear relationship according to the least squares method of:

$$\log G'_{200} = a\cdot\log f + \log b,$$

wherein a denotes a positive number of 0.25 or smaller and b denotes a constant; and

a ratio $(G'_{200})/(G'_{120})$ of below 0.25 wherein (G'_{200}) denotes a dynamic modulus at 200° C. and (G'_{120}) denotes a dynamic modulus at 120° C. respectively at a frequency of 1 (Hz);

wherein the binder resin comprises a copolymer or a mixture thereof comprising polymerized units of a carboxyl group-containing monomer and having crosslinkages including a metallic crosslinkage and a polymeric crosslinkage.

2. The toner according to claim **1**, which contains a magnetic material.

5,180,650

TONER COMPOSITIONS WITH CONDUCTIVE COLORED MAGNETIC PARTICLES

Guerino G. Sacripante, Oakville, and Richard P. N. Veregin, Mississauga, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 31, 1992, Ser. No. 828,620

Int. Cl.[5] G03G *9/083*

U.S. Cl. 430—106.6 **37 Claims**

1. A toner composition comprised of resin particles, pigment, and a colored highly conductive magnetic composition comprised of a core comprised of a metal, and thereover a coating comprised of a lightly colored metal selected from the group consisting of copper, silver, cobalt, tin, gold, manganese, titanium, magnesium, vanadium, chromium, zinc, cadmium, indium, rhodium, nobium, platinum and aluminum, and in contact with the lightly colored metal a top coating comprised of a substantially colorless metal halide.

5,180,651

METHOD FOR THE ADDITION OF POWDERS TO PHOTOGRAPHIC SYSTEMS

Eileen Mason, Penrose, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 555,760, Jul. 23, 1990, abandoned. This application May 1, 1991, Ser. No. 693,897

Int. Cl.[5] G03C *1/72*

U.S. Cl. 430—138 **13 Claims**

1. A process for the formation of a photographic emulsion containing a powder comprising the steps of

(a) forming a plurality of gelatin capsules wherein each of the capsules is formed from two separate sections,

(b) inserting dry powder into each of the plurality of gelatin capsules,

(c) adding the gelatin capsules containing the powder to a photographic emulsion, and

(d) dissolving the gelatin capsules within the . emulsion to allow release of the powder with the emulsion to obtain a uniform dispersion or solution of the powder.

5,180,652

LIGHT- AND HEAT-SENSITIVE COMPOSITION, AND RECORDING MATERIAL

Jun Yamaguchi; Sadao Ishige, both of Shizuoka; Kozo Sato, Kanagawa; Shintaro Washizu, Shizuoka, and Isamu Itoh, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 18, 1990, Ser. No. 466,906

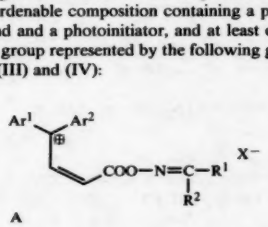
Claims priority, application Japan, Jan. 18, 1989, 1-9509; Dec. 4, 1989, 1-314975

The portion of the term of this patent subsequent to Jan. 1, 2008, has been disclaimed.

Int. Cl.[5] G03F *7/031, 7/033;* **G03C** *1/72;* **B41M** *5/18*

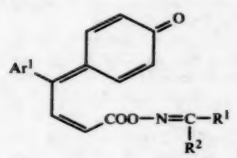
U.S. Cl. 430—281 **11 Claims**

1. A light- and heat-sensitive composition which contains a photo-hardenable composition containing a photo-hardenable compound and a photoinitiator, and at least one dye selected from the group represented by the following general formulae (I), (II), (III) and (IV):



(I)

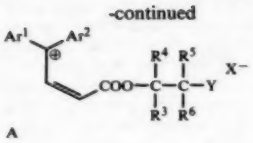
A



(II)

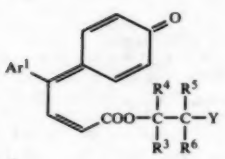
A

-continued



(III)

A



(IV)

A

wherein Ar^1 and Ar^2 each represents an aryl group or a heteroaryl group and may be bound to each other to form a ring; Rs^{1-6} each represents a hydrogen atom, an alkyl group, an alkenyl group, an aralkyl group, an aryl group or a heteroaryl group, provided that both R^1 and R^2 are not hydrogen atoms at the same time; Y represents CN, NO_2, $SO_2—R^7$, SO—R^7, COO—R^7 or

in which R^7 and R^8 is each a hydrogen atom, an alkyl group, an alkenyl group, an aralkyl group, an aryl group or a heteroaryl group; A represents atoms necessary for forming a 5- or 6-membered ring; X^- represents a residue having an electric charge of −1, with the ring

in the general formulae (II) and (IV) being optionally fused with an aromatic ring or a heterocyclic ring, and Ar^1, Ar^2, R^1, R^2, ring A and ring

being optionally substituted by other substituents.

5,180,653

ELECTRON BEAM-CURABLE RESIST COMPOSITION AND METHOD FOR FINE PATTERNING USING THE SAME

Masanori Miyabe, Fujisawa; Hidekatsu Kohara, Chigasaki, and Toshimasa Nakayama, Hiratsuka, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Japan

Division of Ser. No. 438,334, Nov. 16, 1989, Pat. No. 5,057,397. This application Apr. 30, 1991, Ser. No. 693,664

Claims priority, application Japan, Nov. 28, 1988, 63-298335

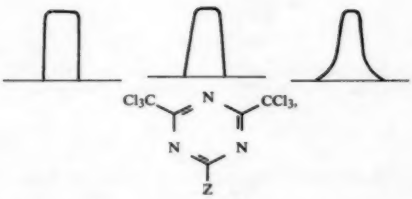
Int. Cl.[5] G03C *5/50*

U.S. Cl. 430—296 **3 Claims**

1. A method for patterning a resist layer by using an electron beam-curable resist composition which comprises the steps of:

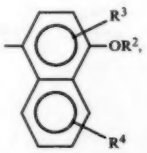
(a) coating a substrate surface with a resist composition in the form of a solution comprising

(A) a 1,3,5-triazine compound represented by the general formula



in which Z is a 4-alkoxy-substituted phenyl group of the general formula

R^1 being an alkyl group having 1 to 5 carbon atoms, or a 4-alkoxy-substituted α-naphthyl group of the general formula



R^2 being an alkyl group having 1 to 5 carbon atoms and R^3 and R^4 being, each independently from the other, a hydrogen atom, hydroxy group or carboxyl group,

(B) a cresol novolac resin, in which at least 30% by weight of the cresol moiety is derived from m-cresol, and

(C) an alkoxymethylated melamine resin, in which the amount of the component (A) is in the range from 2 to 10% by weight based on the total amount of the components (B) and (C) and the weight ratio of the component (B) to the component (C) is in the range from 60:40 to 95:5, and drying to form a uniform electron beam-sensitive resist layer;

(b) irradiating the electron beam-sensitive resist layer patternwise with electron beams to form a latent image;

(c) heating the resist layer having the latent image at a temperature in the range from 90° to 140° C. for a length of time in the range from 30 to 300 seconds to effect sensitization of the latent image; and

(d) developing the thus sensitized latent image with an aqueous solution of an organic alkaline compound as a developer solution.

5,180,654

PROCESSING RADIATION SENSITIVE MEMBERS WITH AQUEOUS ETHYL HEXYL SULPHATE TREATMENT PRIOR TO BURN-IN STEP

Stephen D. Rigby, Near Dewsbury, and Paul A. Styan, Leeds, both of Great Britain, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 442,010, Nov. 28, 1989, abandoned. This application Sep. 18, 1991, Ser. No. 762,069

Claims priority, application United Kingdom, Nov. 29, 1988, 8827813

Int. Cl.[5] G03C *1/52*

U.S. Cl. 430—309 15 Claims

1. A process for treating a radiation sensitive member which comprises image-wise exposure to radiation, development and a burning-in treatment wherein after the development and prior to the burning-in treatment an aqueous solution comprising ethyl hexylsulfate anions is applied to the member.

5,180,655

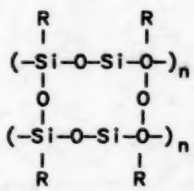
CHEMICAL COMPOSITIONS FOR IMPROVING PHOTOLITHOGRAPHIC PERFORMANCE

James R. Sheats, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 264,297, Oct. 28, 1988, abandoned. This application Jun. 6, 1990, Ser. No. 534,296

Int. Cl.[5] G03C *5/00*

U.S. Cl. 430—327 10 Claims



1. A photolithographic method comprising the steps of:

(a) forming a photoresist layer on a substrate;

(b) forming, on top of said photoresist layer, a bleachable layer containing a bleachable dye in a polymer matrix containing siloxy groups and organic groups;

(c) exposing said bleachable layer with preselected pattern of light to convert said bleachable layer into a contact mask;

(d) making said contact mask insensitive to light used to expose the photoresist layer through this contact mask; and

(e) exposing with light said photoresist layer through said contact mask to transfer the pattern of the contact mask into the photoresist layer.

5,180,656

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS AND THE BLEACH-FIXER APPLICABLE THERETO

Hiroaki Kobayashi, Hino; Shigeharu Koboshi, Sagamihara; Masayuki Kurematsu, Hino, and Masao Ishikawa, Tama, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 385,385, Jul. 27, 1989, abandoned. This application Oct. 31, 1990, Ser. No. 775,244

Claims priority, application Japan, Jul. 29, 1988, 63-190856

Int. Cl.[5] G03C *7/00*

U.S. Cl. 430—393 15 Claims

1. A method of processing a silver halide color photographic light sensitive material comprising:

developing said light-sensitive material with a color developer and bleach-fixing said developed light-sensitive material with a bleach-fixer for a time period of not more than 30 seconds,

wherein said bleach-fixer comprises a chloride in an amount of not less than 2×10^{-2} mol per liter,

wherein said light-sensitive material includes at least one silver halide emulsion layer comprising silver halide grains having a silver chloride content of not less than 80 mol % and said bleach-fixer comprises a ferric organic acid complex in an amount of from 0.25 mol to 1.0 mol per liter of said bleach-fixer and a silver halide fixing agent in an amount of from 0.8 mol to 3.0 mol per liter of said bleach-fixer.

5,180,657

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL OFFERING EXCELLENT HUE REPRODUCTION

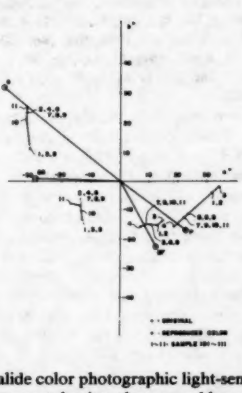
Fumie Fukazawa; Yasushi Irie; Hiroshi Shimazaki; Katuya Yabuuchi, and Satoru Shimba, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 18, 1990, Ser. No. 629,598

Claims priority, application Japan, Dec. 22, 1989, 1-334481; Mar. 14, 1990, 2-63871; Apr. 7, 1990, 2-92721

Int. Cl.[5] G03C *1/46*

U.S. Cl. 430—503 9 Claims



1. A silver halide color photographic light-sensitive material comprising a support having thereon a blue-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer and a red-sensitive silver halide emulsion layer, wherein

the maximum sensitivity wavelength λ_B of a spectral sensitivity distribution of said blue-sensitive layer is in the range of

$$410\ \text{nm} \leqq \lambda_B \leqq 470\ \text{nm};\ \text{and}$$

the sensitivity of said blue-sensitive layer at 480 nm is not more than half of the sensitivity at said wavelength λ_B,

the maximum sensitivity wavelength λ_G of a spectral sensitivity distribution of said green-sensitive layer is in the range of

$$530\ \text{nm} \leqq \lambda_G \leqq 560\ \text{nm};\ \text{and}$$

the sensitivity of said green-sensitive layer at 500 nm is not less than one-fourth of the sensitivity at the wavelength of λ_G.

5,180,658

WHITE POLYESTER COMPOSITION AND SUPPORT FOR PHOTOGRAPHY

Kazuto Kiyohara; Hiromitsu Araki; Toshiaki Yamazaki, and Ichiya Harada, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 491,196, Mar. 9, 1990, abandoned. This application Mar. 26, 1992, Ser. No. 859,239

Claims priority, application Japan, Mar. 16, 1989, 1-64286

Int. Cl.[5] G03C *1/76*

U.S. Cl. 430—533 **21 Claims**

1. In a support for a light-sensitive material, carrying light-sensitive silver halide emulsions for use in photography to produce an image for direct observation, and having a polyester layer consisting essentially of a polyester and a titanium dioxide white pigment, the improvement comprising

said titanium dioxide having been coated with an organic or inorganic compound and thereafter subjected to a heat treatment under a non-reducible atmosphere at a temperature of 350° C. or higher, and wherein

the organic compound is a siloxane polymer;

the inorganic compound is at least one selected from the group consisting of an aluminum compound and a silicon compound; and

said titanium compound is present in an amount of about 1 to 40% by weight based on the polyester.

5,180,659

PHOTOSENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Kazuhiro Murai, and Shun Takada, both of Odawara, Japan, assignors to Konica Corporation, Tokyo, Japan

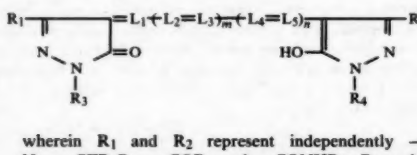
Continuation of Ser. No. 302,790, Jan. 26, 1989, abandoned. This application Jul. 23, 1991, Ser. No. 735,183

Claims priority, application Japan, Jan. 30, 1988, 63-20373

Int. Cl.[5] G06C *1/30, 1/34*

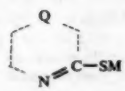
U.S. Cl. 430—623 **30 Claims**

1. A photosensitive silver halide photographic material having a support and provided thereon, photographic component layers, wherein at least one silver halide emulsion layer included in said photographic component layers comprises silver halide grains having silver chloride content of not less than 90 mol %; at least one of said photographic component layers comprises Compound [I] represented by Formula [I]; at least one silver halide emulsion layer included in said photographic component layers comprises Compound [II] represented by Formula [II]; and said photographic material comprises a photographic component layer hardened with at least one of Hardeners [III] and [IV] represented by Formula [III] and [IV], respectively; Formula [I]



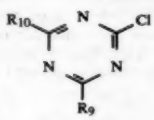
wherein R_1 and R_2 represent independently —C=N—, —CFR_5R_6, —COR_7 and —$CONHR_8$; R_5 and R_6 represent independently a hydrogen atom, a fluorine atom and a fluoroalkyl group having 1 to 4 carbon atoms; R_7 represents one selected from the group consisting of an alkyl group and an aryl group; R_8 represents one selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group and a fluoroalkyl group; R_3 and R_4 represent independently a hydrogen atom, an aliphatic group, an alicyclic group, an aromatic group and a hetrocyclic group; L_1 to L_5 represent a methine group; m and n represent independently 0 and 1;

Formula [II]



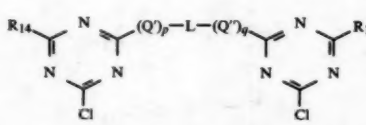
wherein Q represents a group of the atoms necessary to form a 5 or 6-membered hetrocyclic ring including one condensed with a benzene ring; M represents one selected iron the group consisting of a hydrogen atom and a cation;

Formula [II]



wherein R_9 and R_{10} represent independently a chlorine atom, a hydroxyl group, an alkyl group, an alkoxy group, an alkylthio group, —OM', —$NR_{11}R_{12}$ and —$NHCOR_{13}$, provided that one of R_9 and R_{10} represents a group other than a chlorine atom; M' represents a monovalent metallic atom; R_{11} and R_{12} represent independently a hydrogen atom, an alkyl group and an aryl group; R_{13} represents one selected from the group consisting of a hydrogen group, an alkyl group and an aryl group;

Formula [IV]



wherein R_{14} and R_{15} represent independently a chlorine atom, a hydroxy group, an alkyl group, an alkoxy group and —OM'; Q' and Q'' represent independently —O—, —S— and —NH—; M' represents a monovalent metallic atom; L represents one selected from the group consisting of an alkylene group and an arylene group; p and q represent independently 0 and 1.

5,180,660

METHODS AND MATERIALS FOR HIV DETECTION

Tsuneya Ohno, Ridgewood, N.J., assignor to Nissin Shokuhin Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 340,710, Apr. 20, 1989, abandoned, which is a division of Ser. No. 146,371, Feb. 3, 1988, abandoned, which is a continuation-in-part of Ser. No. 64,066, Jun. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 16,282, Feb. 19, 1987, abandoned. This application Mar. 13, 1991, Ser. No. 668,745

Int. Cl.[5] C12Q *1/70, 1/00;* **A23J** *1/00;* **G01N** *33/53*

U.S. Cl. 435—5 **4 Claims**

1. A method for segregating HIV-infected cells in a population of infected and non-infected cells, said method comprising forming an immunological reaction mixture of said cell population and a purified and isolated immunologically active polypeptide in the form of an antibody or chimeric antibody or antibody fragment capable of specific immunobinding with that portion of the HIV virion which is necessarily interactive with T4 surface proteins during HIV infection of host cells and characterized by the capacity to neutralize infectivity of HIV in vitro and by specific immunoreactivity with an antibody immunospecific for human lymphocyte T4 and segregating infected from non-infected cells on the basis of the selective binding of said polypeptide to infected cells.

5,180,661

PLATELET CROSS MATCHING

Daniel B. Brubaker, Redondo Beach, Calif., assignor to Rei, Inc., Torrance, Calif.

Filed Mar. 14, 1988, Ser. No. 167,542
Int. Cl.[5] G01N *33/545, 33/563*
U.S. Cl. 435—7.21 2 Claims

1. A kit for assaying platelets comprising;

a plate having a plurality of wells, each well containing a monolayer of platelets of a single type of HLA, said platelets having been previously washed with 1-cyclohexyl-3-(2-morpholinoethyl)carbodiimide metho-p-toluenesulfonate to thereby enhance bonding between the bottom of each well and the monolayer of platelets contained therein, wherein the plurality of wells contain antigens to more than one type of HLA; and

in a separate container, a supply of (Fab '2) anti-human IgG conjugate alkaline phosphatase.

5,180,662

CYTOTOXIC T LYMPHOCYTE ACTIVATION ASSAY

Michail V. Sitkovsky, Bethesda, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 141,090, Jan. 5, 1990, abandoned. This application Nov. 8, 1990, Ser. No. 610,332
Int. Cl.[5] G12Q *1/44;* G01N *33/577*
U.S. Cl. 435—7.24 11 Claims

1. A method for directly assaying cytotoxic T lymphocyte activation comprising the steps of:

1) incubating cytotoxic T lymphocytes with one or more lymphocyte activating stimuli selected from the group consisting of immobilized anti-TcR monoclonal antibody, an immunocomplex of anti-TcR monoclonal antibody and immobilized rabbit anti-mouse antibody, a mixture of beta-phorbol-12-myristate-13 acetate and ionophore A23187, and immobilized concanavalin A, said activating stimuli inducing the exocytosis of cytotoxic T lymphocyte granules and resulting in the secretion of BLT-esterase; and

2) quantitatively or qualitatively measuring the secretion of said BLT-esterase resulting from the activation of cytotoxic T lymphocyte by the lymphocyte activating stimuli.

5,180,663

IMMUNOCHEMICAL ASSAYS FOR HUMAN AMYLASE ISOENZYMES AND RELATED MONOCLONAL ANTIBODIES, HYDRIDOMA CELL LINES AND PRODUCTION THEREOF

David Bruns, Charlottesville, and David Benjamin, Earlysville, both of Va., assignors to University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Continuation of Ser. No. 236,303, Aug. 24, 1988, abandoned, which is a continuation of Ser. No. 579,324, Feb. 13, 1984, abandoned. This application Jul. 2, 1991, Ser. No. 726,160
Int. Cl.[5] C12Q *1/00, 1/40*
U.S. Cl. 435—7.4 19 Claims

3. A HABB monoclonal antibody which reacts with human saiivary amylase and ovarian tumor amylase but not with human pancreatic amylase.

13. A process of measuring pancreatic amylase comprising first determining the total amylase concentration in a part of a sample and then reacting another part of the same sample with HABB monoclonal antibodies which are reactive to human salivary amylase and ovarian tumor amylase but not human pancreatic amylase, which have also been coupled to an insoluble matrix, centrifuging the insoluble complex down to a pellet, taking the supernatant and determining the total amylase therein which is the pancreatic amylase.

5,180,664

WASHING SOLUTION, WHICH CONTAINS A COMPLEXING AGENT FOR METAL IONS, FOR A SOLID-PHASE IMMUNOMETRIC METHOD, AND THE USE THEREOF

Hans-Detlef Dopatka, Marburg, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Nov. 26, 1991, Ser. No. 798,192
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1990, 4037776
Int. Cl.[5] G01N *33/537*
U.S. Cl. 435—7.92 11 Claims

1. A method for the assay of an immunological ligand comprising the steps of:

a) contacting a specimen suspected on containing said immunological ligand with one or more receptors to said ligand, at least one of which is labeled for detection, to form a detectable immunological complex between said ligand and said one or more receptors,

b) separating said detectable complex from uncomplexed materials by washing with an aqueous wash solution, which contains a complexing agent for metal ions, and

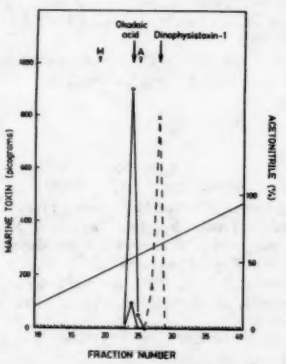
c) detecting either the amount of detectable complex or uncomplexed labeled receptor.

5,180,665

METHOD FOR QUANTITATIVELY ASSAYING THE PRESENCE OF DIARRHETIC SHELLFISH POISONING TOXINS IN MARINE SAMPLES

Charles Holmes, Edmonton, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by The National Research Council of Canada, Ottawa, Canada

Filed Nov. 21, 1990, Ser. No. 615,711
Int. Cl.[5] C12Q *1/42*
U.S. Cl. 435—21 17 Claims



1. A method for quantitatively assaying the presence in marine samples of diarrhetic shellfish poisoning (DSP) toxins having phosphatase inhibitory activity, said method comprising:

preparing a marine extract;

fractionating said marine extract to obtain a plurality of extract fractions, at least one of said fractions containing the toxin to be assayed;

selecting the extract fraction containing the toxin to be assayed;

incorporating at least one protein phosphatase inhibited by said toxin and a labelled physiological substrate acted upon by said phosphatase to said extract fraction; and

quantitatively measuring the amount of toxin present in said extract fraction by means of said label and said substrate through the measurement of the ability of said fraction to

inhibit catalysis of said labelled substrate by said protein phosphatase.

5,180,666

METHOD AND CELL LINE FOR TESTING MUTAGENICITY OF A CHEMICAL

J. Christopher States, Royal Oak; Ronald N. Hines, and Raymond F. Novak, both of West Bloomfield, all of Mich., assignors to Wayne State University, Detroit, Mich.

Filed Jun. 27, 1991, Ser. No. 721,775
Int. Cl.[5] C12Q *1/02;* C12N *5/22, 15/12, 15/09*
U.S. Cl. 435—29 15 Claims

1. A method of testing for mutagenicity of a chemical by exposing human fibroblast test cells normally not including any cytochrome P450 activity, the test cells being transformed to express cytochrome P450 enzymes through the human CYP-1A1 gene to the chemical in vitro; intracellularly metabolizing the chemical into a mutagenic metabolite by oxidatively metabolizing the chemical within the fibroblasts through the intracellular cytochrome P450 mixed function oxidase enzymes expressed by said transformed fibroblasts; and detecting gene damage in the test cells as an indication of mutagenicity of the chemical.

5,180,667

GENES ENCODING EGLIN C MUTANTS

Markus G. Grütter, Hochwald, Switzerland; Dirk Heinz, Rheinfelden, Fed. Rep. of Germany, and Manfred Liersch, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y. and UCP Gen-Pharma, AG, Kirchberg, Switzerland

Division of Ser. No. 320,139, Mar. 7, 1989, Pat. No. 5,079,229.
This application Oct. 11, 1991, Ser. No. 776,547
Claims priority, application Switzerland, Mar. 7, 1988, 840/88
Int. Cl.[5] C12N *15/15, 1/19;* C12P *21/02*
U.S. Cl. 435—69.2 4 Claims

1. An isolated and purified DNA molecule consisting essentially of a gene encoding (Arg45)-eglin C.

5,180,668

HIRUDIN DERIVATIVE

Peter Crause, Offenbach; Paul Habermann, Frankfurt am Main, and Dominique Tripier, Eppstein/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 10, 1989, Ser. No. 295,422
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1988, 3805540
Int. Cl.[5] A61K *37/64;* C07K *13/00;* C07H *21/04;* G12N *15/64*
U.S. Cl. 435—69.2 6 Claims

1. A hirudin derivative with the amino acid sequence

0 1
Leu—Thr—Tyr—Thr—Asp—Cys—Thr—Glu—Ser—Gly—
10
Gln—Asn—Leu—Cys—Leu—Cys—Glu—Gly—Ser—Asn—
20
Val—Cys—Gly—Gln—Gly—Asn—Lys—Cys—Ile—Leu—
30
Gly—Ser—Asp—Gly—Glu—Lys—Asn—Gln—Cys—Val—
40
Thr—Gly—Glu—Gly—Thr—Pro—Lys—Pro—Gln—Ser—
50
His—Asn—Asp—Gly—Asp—Phe—Glu—Glu—Ile—Pro—
60
Glu—Glu—Tyr—Leu—Gln.

5,180,669

LIQUEFACTION OF GRANULAR-STARCH SLURRIES USING ALPHA-AMYLASE IN THE PRESENCE OF CARBONATE ION

Richard L. Antrim, Hawthorne Woods, Ill., assignor to Genencor International, Inc., Rochester, N.Y.

Filed Mar. 27, 1991, Ser. No. 676,770
Int. Cl.[5] C12P *19/14, 19/12;* C12N *1/00*
U.S. Cl. 435—99 8 Claims

1. A process of liquefying a granular starch slurry comprising:

(1)

a) adding to the slurry an excess of carbonate ion in an amount of from about 2 mM to about 20 mM in excess of the amount of carbonate ion needed to adjust the pH of the slurry to a pH of about 5.0 to about 6.0 and adjusting the pH of the slurry to a pH from about 5.0 to about 6.0;

b) adding to the slurry about 10 liquefons or more of an alpha-amylase per gram of dry starch in the slurry; and

(2) heating the slurry from step (1) at a temperature from about 100° C. to about 105° C. for an initial period and then holding the slurry at a temperature from about 90° C. to about 100° C. for a length of time sufficient to liquefy the starch.

5,180,670

METHOD FOR PURIFICATION OF MITOMYCIN C

Satoshi Iwata, and Michio Shiomi, both of Hofu, Japan, assignors to Kyowa Hakko Kogyo, Ltd., Tokyo, Japan

Filed Dec. 18, 1990, Ser. No. 629,453
Int. Cl.[5] C12P *17/18;* A01N *43/38;* C07D *487/00*
U.S. Cl. 435—119 7 Claims

1. A method for purification of mitomycin C which comprises the steps of:

a. treating the culture of a mitomycin C-producing microorganism with polystyrene divinylbenzene type resin to adsorb mitomycin C onto said resin;

b. eluting mitomycin C with ethyl acetate out of said resin;

c. adding phosphate buffer to said eluate and then evaporating ethyl acetate;

d. passing, under pressure, the residual remaining after the evaporation through a column packed with a reverse phase adsorbent having a small particle diameter to adsorb mitomycin C onto said adsorbent;

e. eluting mitomycin C with aqueous methanol out of said adsorbent under pressure;

f. treating said eluate with polystyrene divinylbenzene type resin to adsorb mitomycin C onto said resin;

g. eluting mitomycin C with methanol out of said resin; and

h. concentrating the methanol eluate to crystallize mitomycin C.

5,180,671

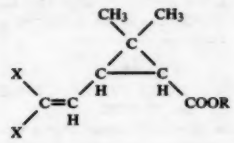
METHOD FOR PRODUCING OPTICALLY ACTIVE CYCLOPROPANE CARBOXYLIC ACID

Kanji Nishizawa; Satoshi Mitsuda; Ryohei Komaki; Masako Sugimoto, all of Hyogo; Chiaki Sugiki, Osaka; Yasutaka Ogami, Hyogo; Kazumi Sonoda, Hyogo, and Fumitaka Kishimoto, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

PCT No. PCT/JP87/00244, § 371 Date Dec. 16, 1987, § 102(e) Date Dec. 16, 1987, PCT Pub. No. WO87/06269, PCT Pub. Date Oct. 22, 1987
Continuation of Ser. No. 143,848, Dec. 16, 1987, abandoned.
This PCT application Apr. 16, 1987, Ser. No. 620,385
Claims priority, application Japan, Apr. 16, 1986, 61-89803; Apr. 24, 1986, 61-95444
Int. Cl.[5] C12P *7/40;* C07C *51/09*
U.S. Cl. 435—136 3 Claims

1. A process for producing an optically active (+)-cis-cyclopropane carboxylic acid or derivatives thereof, which com-

prises allowing a (±)-cis-cyclopropane carboxylic acid ester represented by formula (IV),

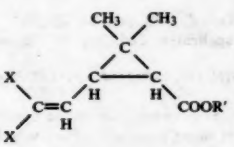


(IV)

wherein X is selected from the group consisting of a chlorine atom, a bromine atom, a methyl group, and a trifluoromethyl group, and R is selected from the group consisting of a C_1–C_4 alkyl group and a C_1–C_4 alkyl group substituted with a halogen atom, to react with a microorganism selected from the group consisting of

Rhodosporidium toruloides	IFO-0559,
Rhodosporidium toruloides	IFO-0871,
RHodosporidium toruloides	IFO-8766,
Rhodotorula glutinis	IFO-1501,
Hansenula anomala var. *ciferii*	IFO-0994,
Torulopsis candida	IFO-0768,
Arthrobacter citreus	IFO-12957,
Pseudomonas putida	IFO-12996,
Escherichia coli	IFO-13168,
Bacillus licheniformis	IFO-12195,
Flavobacterium capsulatum	IFO-12533,
Achromobacter lyticus	ATTC-21456,
Thizomucor pusillus	IFO-9856,
Flammulina velutipes	IFO-7046,
Geotrichum candidum	IFO-4597,
Dispdascus uninucleatus	ATTC-14626,
Beauveria bassiana	ATTC-26037,
Metschnikowia pulcherrima	IFO-0561,
Kluyveromyces lactis	IFO-1090,
Frateuria aurantia	IFO-3247, and
Klebsiella pneumoniae	IFO-12059,

or an esterase produced thereby which can selectively and asymmetrically hydrolyze a (±)-cis-cyclopropane carboxylic acid ester of formula (IV), to produce an optically active (+)-cis-cyclopropane carboxylic acid or derivatives thereof represented by formula (III),



(III)

wherein X is as above, and R′ is selected from the group consisting of hydrogen atom and a metal ion, and a (−)-cis-cyclopropane carboxylic acid ester of formula (IV), and then recovering said optically active (+)-cis-cyclopropane carboxylic acid or derivatives thereof represented by formula (III).

5,180,672

ASCORBATE OXIDASE ISOLATED FROM ACREMONIUM SP. HI-25 FERM BP-3124

Homare Itoh, Aichi; Takashi Shin, Hyogo; Takahisa Yajima, and Shigeki Fukuyasu, both of Aichi, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 6, 1991, Ser. No. 653,709

Claims priority, application Japan, Feb. 13, 1990, 2-32175

Int. Cl.[5] C12N *9/04, 1/12, 1/00*

U.S. Cl. 435—190 **1 Claim**

1. An isolated ascorbate oxidase having the properties as mentioned below:

(1) having a pH optimum in the range of pH 3.5–4.5;

(2) being activated by Fe^{++} and inhibited by Cu^{++};

(3) having a molecular weight of 85,000±5,000 as determined by the gel filtration method, and subunit molecular weight of 23,000+2,000 as determined by the sodium dodecyl sulfate/polyacrylamide gel electrophoresis method;

(4) having an isoelectric point of pI 4.0 as measured by the isoelectric focusing method;

(5) showing stable activity at pH 8.0 when heated to a temperature as high as 60° C. for 30 minutes; and

(6) showing stable activity at 4° C. over the pH range of pH 4–11.

5,180,673

CLONING RESTRICTION AND MODIFICATION GENES

Geoffrey G. Wilson, Boxford, and Donald Nwankwo, Peabody, both of Mass., assignors to New England Biolabs, Inc., Beverly, Mass.

Continuation of Ser. No. 826,892, Feb. 6, 1986, which is a continuation-in-part of Ser. No. 707,079, Mar. 1, 1985. This application Mar. 13, 1989, Ser. No. 323,114

Int. Cl.[5] C12N *9/22, 15/55*

U.S. Cl. 435—199 **8 Claims**

1. Isolated DNA which codes for the restriction enconuclease Hind III.

5,180,674

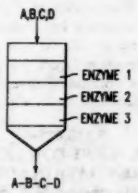
SACCHARIDE COMPOSITIONS, METHODS AND APPARATUS FOR THEIR SYNTHESIS

Stephen Roth, Gladwyne, Pa., assignor to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 509,560, Apr. 16, 1990, abandoned. This application Apr. 11, 1991, Ser. No. 683,810

Int. Cl.[5] C12M *1/40*

U.S. Cl. 435—288 **25 Claims**



1. An apparatus for a glycosyltransferase-catalyzed synthesis of a saccharide composition from saccharide units and an acceptor moiety, said apparatus comprising:

a reactor;

at least four different glycosyltransferases specific for the synthesis of said saccharide composition in said reactor;

inlet means for introducing an acceptor moiety and a plurality of required saccharide units into said reactor such that said saccharide composition is synthesized; and

outlet means for discharging said saccharide composition from said reactor;

wherein said acceptor moiety is one member selected from the group consisting of proteins, glycoproteins, lipids, glycolipids and carbohydrates.

5,180,675

RECOMBINANT FOWLPOX VIRUS

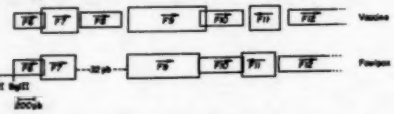
Robert Drillien, Strasbourg, and Danièle Spehner, Eckbolsheim, both of France, assignors to Transgene, S. A., Courbevoie Cedex, France

Filed Oct. 28, 1988, Ser. No. 264,493

Claims priority, application France, Oct. 29, 1987, 87 15001; Jun. 20, 1988, 88 08226

Int. Cl.[5] C12N *7/01, 15/86;* A61K *39/275*

U.S. Cl. 435—235.1 2 Claims



1. A recombinant fowlpox virus, the genome of which comprises a DNA fragment encoding a polypeptide which is heterologous to the fowlpox virus, under the control of appropriate elements providing for its expression in a cell infected with said recombinant fowlpox virus; said DNA fragment being inserted between ORF7 and the 32-bp noncoding intergenic region upstream of ORF9.

5,180,676

METHOD OF CULTIVATING ANIMAL OR PLANT CELLS

Yataro Ichikawa, Tokorozawa; Kimihiko Hamamoto, Hino, and Michiyuki Tokashiki, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 342,685, Apr. 26, 1989, abandoned, which is a continuation of Ser. No. 744,685, Jun. 14, 1985, abandoned. This application Mar. 13, 1991, Ser. No. 668,473

Claims priority, application Japan, Jun. 14, 1984, 59-120724; Jul. 27, 1984, 59-155424; Nov. 30, 1984, 59-251972

Int. Cl.[5] C12N *5/00, 5/02, 5/04, 5/06*

U.S. Cl. 435—240.1 17 Claims

1. A method of cultivating animal or plant cells, which consists essentially of contacting a cultivation liquor having animal or plant cells suspended therein with a liquid fluorocarbon having molecular oxygen dissolved therein, characterized in that said cultivation liquor forms a continuous suspension phase which has cell densities of at least 4×10^6 cells/ml, that said contact is made by feeding said liquid fluorocarbon into the cultivation liquor from above the cultivation liquor such that 1 ml of liquid fluorocarbon has a surface area of about 6 to about 300 cm^2 whereby the liquid fluorocarbon falls downward through the cultivation liquor by gravity, and that said cultivation liquor has a volume of at least about 10 liters.

5,180,677

LYSING REAGENT FOR LEUKOCYTE DIFFERENTIATION METHOD

Ludmilla P. Di Ianni, Hawthorne, N.J., and Edward L. Carver, Jr., Oxford, Conn., assignors to Fisher Scientific Company, Pittsburgh, Pa.

Filed Jul. 5, 1988, Ser. No. 215,396

Int. Cl.[5] G01N *31/00*

U.S. Cl. 436—17 25 Claims

1. In a lysing reagent for use in automated hematological measurement being an aqueous solin containing dodecyltrimethyl ammonium halide and a second cationic agent, the improvement wherein the second cationic agent is selected from the group consisting of benzyltrialkylammonium halides of the formula:

$$Ph—CH_2—N^+(R)_2—Q\ X^-$$

and alkylpyridinium halides of the formula:

$$A{=}N^+Q\ x^-$$

wherein Ph is phenyl, R is methyl or ethyl, Q is alkyl of 14 to 16 carbons, A=N is pyridinium and X is chlorine or bromine.

5,180,678

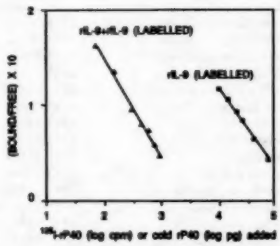
USES OF SUBSTANTIALLY PURE INTERLEUKIN-9 RECEPTOR

Catherine Druez, Sint-Stevens-Woluwe; Pierre Coulie, Kraainem; Catherine Uyttenhove, Chaumont-Gistoux, and Jacques Van Snick, Kraainem, all of Belgium, assignors to Ludwig Institute for Cancer Research

Division of Ser. No. 585,229, Sep. 19, 1990, Pat. No. 5,116,951. This application Feb. 6, 1992, Ser. No. 832,192

Int. Cl.[5] G01N *33/50, 33/58, 33/60, 33/68*

U.S. Cl. 436—501 6 Claims



1. Method for determining interleukin-9 in a sample, comprising contacting said sample with labelled, substantially pure interleukin 9 receptor (IL-9R) under conditions favoring binding of interleukin 9 to said substantially pure IL9-R and determining said binding as an indication of interleukin 9 in said sample.

5,180,679

DIAGNOSTIC AGENT AND A METHOD FOR THE DETERMINATION OF APOLIPOPROTEIN B

Rudolf Schmidtberger, Marburg, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Oct. 6, 1988, Ser. No. 254,062

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1987, 3734015

Int. Cl.[5] G01N *33/543, 33/546, 33/547, 33/557*

U.S. Cl. 436—518 4 Claims

1. A method for the determination of the concentration of Apo B in a sample of blood, plasma or serum, which comprises steps of

(i) mixing the sample with a dispersion of particles to which antibodies against apolipoprotein B are bound,

(ii) determining the time until agglutination takes place, and

(iii) calculating the relevant concentration of Apo B from a reference curve.

5,180,680

METHOD OF FABRICATING ELECTRICALLY ERASABLE READ ONLY MEMORY CELL

Ming-Tzong Yang, Hsinchu, Taiwan, assignor to United Microelectronics Corporation, Hsinchu, Taiwan

Filed May 17, 1991, Ser. No. 701,701

Int. Cl.[5] H01L *21/70*

U.S. Cl. 437—38 15 Claims

1. A method of fabricating an electrically programmable read only memory cell on a semiconductor substrate comprising:

forming a trench in said substrate,

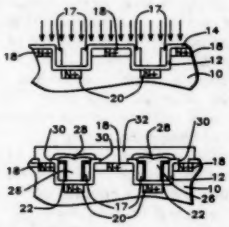
forming a first insulating layer over the surface of said substrate, including the sidewalls and bottom of said trench,

forming first individual polycrystalline silicon layers on opposed sidewalls of said trench, which form floating gates,

implanting a first type dopant into said substrate thereby forming a continuous doped region in the bottom of said trench, and also individual doped regions on opposite sides of said trench, adjacent to the top surface of said substrate,

forming a second insulating layer over said first individual polycrystalline silicon layers,

forming an elongated second continuous polycrystalline silicon layer in said trench over said first individual polycrystalline silicon layers,



forming a third insulating layer over said second polycrystalline silicon layer,

forming contact openings in said first insulating layer on the top surface of said substrate to said individual doped regions that are adjacent to said first individual polycrystalline silicon layers in said trench,

forming a contact stripe over and transverse to said trench that contacts said substrate through said contact openings, which establish electrical contact to said first type individual doped regions,

forming an electrical contact to the first type doped continuous region under said trench, and

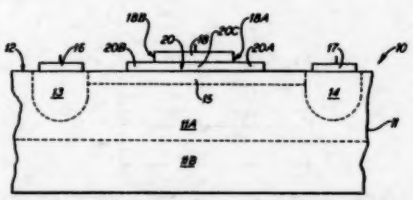
forming an electrical contact to said elongated second polycrystalline silicon layer to thereby form a control gate.

5,180,681

METHOD OF MAKING HIGH CURRENT, HIGH VOLTAGE BREAKDOWN FIELD EFFECT TRANSISTOR

Umesh K. Mishra, and Robert J. Trew, both of Cary, N.C., assignors to North Carolina State University, Raleigh, N.C.

Division of Ser. No. 494,239, Mar. 15, 1990, Pat. No. 5,084,743.
This application Oct. 22, 1991, Ser. No. 781,096
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—40 **20 Claims**



1. A method of fabricating an integrated circuit compound semiconductor metal semiconductor field effect transistor (MESFET) comprising the steps of:

providing a compound semiconductor substrate having source and drain regions formed therein at one face thereof and a channel formed between said source and said drain regions;

epitaxially forming an electron trap layer having at least 10^{18} electron traps per cubic centimeter on said one face, over at least part of said channel for trapping electrons which flow on said one face and preventing surface current from flowing on said one face;

forming drain and source contacts over said drain and source respectively; and

forming a gate contact on an interior portion of said electron trap layer, so that said electron trap layer extends beyond said gate contact towards said drain and traps electrons which flow on said one face from said gate contact towards said drain, thereby preventing surface current from flowing on said one face from said gate contact towards said drain;

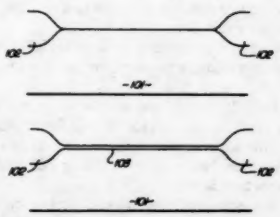
whereby said MESFET is resistant to voltage breakdown.

5,180,682

SEMICONDUCTOR DEVICE AND METHOD OF PRODUCING SEMICONDUCTOR DEVICE

Masahiro Takeuchi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 395,735, Aug. 17, 1989, Pat. No. 5,060,033.
This application May 28, 1991, Ser. No. 707,160
Claims priority, application Japan, Aug. 18, 1988, 63-205535
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—44 **14 Claims**



1. A method of producing a semiconductor device comprising the steps of:

forming a first insulating film on a surface of a semiconductor substrate of a first conductivity type;

ion-implanting first impurities of said first conductivity type into said semiconductor substrate to create a first impurity concentration having a peak;

forming a gate electrode on said first insulating film;

ion-implanting second impurities of a second conductivity type opposite to said first conductivity type of said semiconductor substrate into said semiconductor substrate to create a second impurity concentration having a peak, with said gate electrode serving as a mask, in such a manner that the peak of the concentration of said second impurities is at a shallower depth than the peak of the concentration of said first impurities;

forming a side wall insulating film on said gate electrode; and

ion-implanting third impurities of said second conductivity type into said semiconductor substrate with said gate electrode and said side wall insulating film serving as masks.

5,180,683
METHOD OF MANUFACTURING STACKED CAPACITOR TYPE SEMICONDUCTOR MEMORY DEVICE

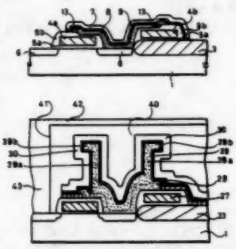
Wataru Wakamiya; Yoshinori Tanaka; Takahisa Eimori; Hiroji Ozaki; Hiroshi Kimura, and Shinichi Satoh, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 364,033, Jun. 9, 1989, Pat. No. 5,047,817. This application Jul. 10, 1991, Ser. No. 727,781

Claims priority, application Japan, Jun. 10, 1988, 63-144311; Mar. 30, 1989, 1-83171

Int. Cl.[5] H01L *21/70*

U.S. Cl. 437—47 **6 Claims**



5. A manufacturing method of a semiconductor memory device including a memory cell having one access transistor and one capacitor, comprising the steps of:

forming a gate insulating film on a major surface of a semiconductor substrate having an element isolating region,

forming a gate electrode and an interconnection layer by forming and patterning a conductive layer on said gate insulating film and said element isolating region,

forming a pair of impurity regions by ion implanting impurities into said semiconductor substrate, using said gate electrode as a mask,

covering the top surface and the side surfaces of said gate electrode and said interconnection layer with a first insulating layer,

forming a first electrode layer on the surface of one of said impurity regions, the surface of said first insulating layer covering the surface of said gate electrode and the surface of said first insulating layer covering the surface of said interconnection layer,

forming a projecting portion on said first electrode layer,

forming a dielectric layer on the surface of said first electrode layer, and

forming a second electrode layer on the surface of said dielectric layer, wherein

said step of forming a projecting portion on said first electrode layer further comprises the steps of:

forming a conductive layer on the surface of one of said impurity regions and the surface of said first insulating layer to be patterned in a prescribed shape,

forming a second insulating layer to a relative thickness on the surfaces of said first insulating layer and said conductive layer, said second insulating layer having an upper planar surface,

forming an opening down to the surface of said conductive layer in said second insulating layer,

forming another conductive layer on the upper planar surface of said second insulating layer, the internal side surface of said opening portion, and the surface of said conductive layer exposed at the bottom of said opening,

forming a resist pattern of a prescribed shape on the surface of said other conductive layer, and

etching said other conductive layer using said resist pattern as a mask to form a wall portion along said opening and an upper end portion on said upper planar surface of said second insulating layer and circumscribing said opening.

6. A manufacturing method of a semiconductor memory device including a memory cell having one access transistor and one capacitor, said method comprising the steps of:

forming a gate insulating film on a major surface of a semiconductor substrate having an element isolating region,

forming a gate electrode and an interconnection layer by forming ad patterning a conductive layer on said gate insulating film and said element isolating region,

forming a pair of impurity regions by ion implanting impurities into said semiconductor substrate, using said gate electrode as a mask,

covering the top surface and the side surfaces of said gate electrode and said interconnection layer with an insulating layer,

forming a step portion on the surface of said insulating layer,

forming a first electrode layer on the surface of said insulating layer and on a surface of one of said impurity regions,

forming a dielectric layer on the surface of said first electrode layer, and

forming a second electrode layer on the surface of said dielectric layer, wherein

said step of forming said step portion on the surface of said insulating layer comprises the step of:

removing a portion of the surface region of said insulating layer covering the surfaces of aid gate electrode and said interconnection layer to a prescribed thickness, and

said step of forming said first electrode layer on the surface of said insulating layer comprises the step of:

forming said first electrode layer having a step portion following the shape of the step of said insulating layer on the surface of said gate electrode and said interconnection layer.

5,180,684
SEMICONDUCTOR GROWTH PROCESS

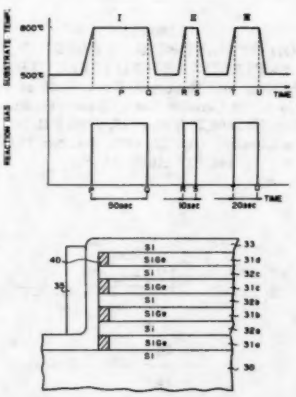
Hiroshi Fujioka, Tokyo, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 6, 1990, Ser. No. 488,837

Claims priority, application Japan, Mar. 8, 1989, 1-055827

Int. Cl.[5] H01L *21/20, 21/205*

U.S. Cl. 437—110 **6 Claims**



1. A semiconductor growth process wherein a plurality of layers each consisting of a different kind of semiconductor material are grown, comprising the steps of:

heating a substrate to a first growth starting temperature at which a growth of a first semiconductor layer can be started;

supplying a first material gas to a surface of said substrate to

cause a growth of said first semiconductor layer after said substrate is heated to said first growth starting temperature;

cooling said substrate to a temperature below said first growth starting temperature and below a following second growth starting temperature, and at the same time, stopping the supply of said first material gas, to stop the growth of said first semiconductor layer;

reheating said substrate to said second growth starting temperature, at which a growth of a second semiconductor layer can be started; and

supplying a second material gas to the surface of said substrate to cause a growth of said second semiconductor layer after said substrate is reheated to said second growth starting temperature.

5,180,685

METHOD FOR THE PRODUCTION OF A SEMICONDUCTOR LASER DEVICE

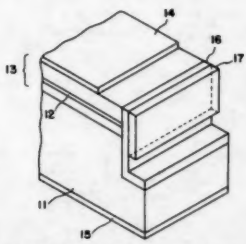
Osamu Yamamoto, Nara, and Hidenori Kawanishi, Tsukuba, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 2, 1991, Ser. No. 678,834

Claims priority, application Japan, Apr. 2, 1990, 2-87714

Int. Cl.[5] H01L *21/20*

U.S. Cl. 437—129 **6 Claims**



1. A method for the production of a semiconductor laser device which emits laser light from an end facet thereof, comprising the steps of:

forming a multi-layered structure including an active layer for laser oscillation on a semiconductor substrate;

etching the semiconductor substrate and the multi-layered structure to form a plurality of striped grooves parallel to each other in such a manner that a plurality of projections are formed on the side face of the multi-layered structure in the striped grooves;

separating the projections from the multi-layered structure to form a pair of cleavage planes each functioning as a resonator facet;

forming a large-band-gap layer on at least one of the cleavage planes on the light-emitting side, the large-band-gap layer having a larger band gap than that of the active layer;

forming a reflecting film on the large-band-gap layer; and

finally cleaving the semiconductor substrate and the multi-layered structure to obtain a plurality of semiconductor laser devices.

5,180,686

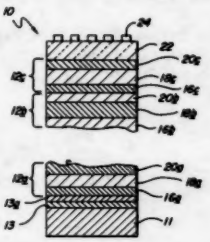
METHOD FOR CONTINUOUSLY DEPOSITING A TRANSPARENT OXIDE MATERIAL BY CHEMICAL PYROLYSIS

Arindam Banerjee, Madison Heights, and Subhendu Guha, Troy, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 602,893, Oct. 23, 1990, abandoned, which is a continuation of Ser. No. 264,549, Oct. 31, 1988, abandoned. This application Oct. 1, 1991, Ser. No. 770,734

Int. Cl.[5] H01L *21/00, 21/02, 31/04, 31/18*

U.S. Cl. 437—181 **10 Claims**



1. In a process for the continuous fabrication of photovoltaic devices: said devices including a substrate; a light scattering back reflector including a deposited thin film of silver, and a body of thin film layers of silicon alloy material; the improvement comprising the step of: continuously depositing, by chemical spray pyrolysis, a layer of zinc oxide material between the thin film of silver of said light scattering back reflector and said layers of silicon alloy material, said pyrolysis deposited layer adapted to (1) enhance the light scattering provided by said back reflector and (2) substantially prevent interdiffusion between said semiconductor body and said back reflector.

5,180,687

DEPOSITED FILM FORMATION METHOD UTILIZING SELECTIVE DEPOSITION BY USE OF ALKYL ALUMINUM HYDRIDE

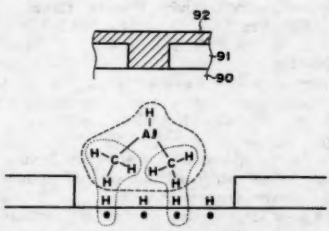
Nobuo Mikoshiba; Kazuo Tsubouchi, and Kazuya Masu, all of Sendai, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1990, Ser. No. 587,045

Claims priority, application Japan, Sep. 26, 1989, 1-250021; Feb. 19, 1990, 2-36198

Int. Cl.[5] H01L *21/285*

U.S. Cl. 437—187 **21 Claims**



1. A deposited film formation method comprising the steps of:

(a) selectively forming by chemical vapor depositing a metal deposit composed mainly of aluminum on an electron donative surface of a substrate having said electron donative surface and a non-electron donative surface by em-

ploying an alkyl aluminum hydride as a raw gas material; and

(b) non-selectively forming a metal film composed mainly of aluminum on said selectively formed metal deposit and on said non-electron donative surface by a deposition method different from said chemical vapor deposition.

5,180,688

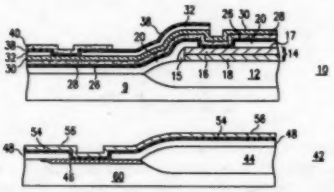
METHOD OF FORMING TUNNELING DIFFUSION BARRIER FOR LOCAL INTERCONNECT AND POLYSILICON HIGH IMPEDANCE DEVICE

Frank R. Bryant, Denton, and John L. Waters, Carrollton, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 560,384, Jul. 31, 1990, Pat. No. 5,065,225. This application Aug. 6, 1991, Ser. No. 741,792

Int. Cl.[5] H01L *21/283*

U.S. Cl. 437—195 **5 Claims**



1. A method of forming an interconnect of an integrated circuit, comprising the steps of:

forming a first silicon layer having a first conductivity type;

forming an insulating layer over the first silicon layer with an opening to expose selected regions in the first silicon layer;

forming a barrier insulating layer covering exposed regions in the first silicon layer and portions of the insulating layer, wherein the barrier insulating layer has a thickness sufficient to facilitate tunneling of electrons through the barrier layer, and wherein the barrier layer thickness is between approximately 5 and 50 angstroms to prevent the diffusion of dopant material between the first silicon layer and the second polysilicon layer; and,

forming a second polysilicon layer having a second conductivity type over the barrier insulating layer.

5,180,689

TAPERED OPENING SIDEWALL WITH MULTI-STEP ETCHING PROCESS

Hsien-Tsung Liu, Keelung; Jin-Yuan Lee, Hsin-Chu; Jiann-Kwang Wang, Hsin Chu; Chue-San Yoo, Taipei, and Pei-Jan Wang, Taichung, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsinchu, Taiwan

Filed Sep. 10, 1991, Ser. No. 757,135

Int. Cl.[5] H01L *21/465*

U.S. Cl. 437—228 **20 Claims**

1. A method for making a tapered opening for an integrated circuit having a feature size of about one micrometer or less which will in due course be filled with a metallurgy conductor comprising:

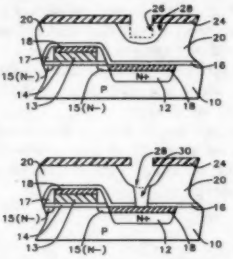
providing an integrated circuit structure having device elements within a semiconductor substrate and multilayer insulating layers thereover;

forming a resist masking layer over the said multilayer insulating layer having openings therein in the areas where the said openings are desired;

anisotropically etching into said multilayer insulating layer through a first thickness to form a first opening using said resist masking layer as a mask;

isotropic etching through a second thickness portion of said multilayer insulating layer to substantially uniformly enlarge said first opening while using unchanged said resist layer;

anisotropically etching through the remaining thickness of



said multilayer insulating layer to the semiconductor substrate to form said tapered opening with a metal step coverage improvement between about 20 to 60%; and removing the said resist layer.

5,180,690

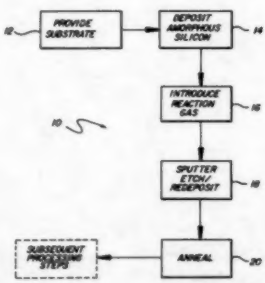
METHOD OF FORMING A LAYER OF DOPED CRYSTALLINE SEMICONDUCTOR ALLOY MATERIAL

Wolodymyr Czubatyj, Warren; Stanford R. Ovshinsky, Bloomfield Hills; Guy C. Wicker, Southfield; David Beglau, Dearborn; Ronald Himmler, Sterling Heights; David Jablonski, Drayton Plains, and Subhendu Guha, Troy, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 284,275, Dec. 14, 1988, abandoned. This application Jul. 9, 1990, Ser. No. 551,684

Int. Cl.[5] H01L *21/00, 21/02, 21/225, 21/324*

U.S. Cl. 437—233 **32 Claims**



1. A method for the low temperature fabrication of doped polycrystalline semiconductor alloy material comprising the steps of:

providing an evacuable enclosure, said enclosure including a first electrode and a second, spacedly disposed substrate electrode;

providing a substrate having a body of amorphous semiconductor alloy material thereupon, and disposing said substrate upon said substrate electrode;

evacuating said enclosure to sub-atmospheric pressure;

introducing a reaction gas into the interior of said enclosure, said reaction gas comprising a diluent gas and a precursor dopant gas;

establishing an electrical potential between said first and said second electrodes, said electrical potential being sufficient to decompose said precursor dopant gas and sputter-etch at least a portion of said amorphous semiconductor alloy material from said substrate;

depositing a layer of doped amorphous semiconductor alloy

material from said decomposed dopant gas and sputter-etched semiconductor alloy material upon said body of amorphous semiconductor alloy material without providing an external gaseous source of semiconductor material; and

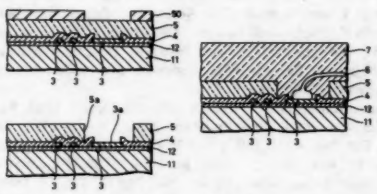
subjecting said doped amorphous semiconductor alloy material coated body of amorphous semiconductor alloy material to an activation energy sufficient to at least partially crystallize the doped layer thereof and incorporate the dopant element into the matrix of the crystallized layer.

5,180,691

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE SEALED WITH MOLDING RESIN EMPLOYING A STRESS BUFFERING FILM OF SILICONE

Etsushi Adachi; Hiroshi Adachi; Hiroshi Mochizuki, and Hirozoh Kanegae, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1992, Ser. No. 827,220
Claims priority, application Japan, Jan. 31, 1991, 3-10908
Int. Cl.[5] H01L *21/02*
U.S. Cl. 437—235 5 Claims

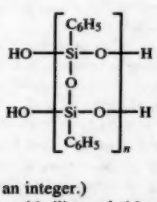


1. A method of manufacturing a semiconductor device sealed with molding resin, comprising the steps of:

providing a semiconductor substrate having an element;

forming an aluminum interconnection pattern including an aluminum electrode pad on said semiconductor substrate to be electrically connected to said element;

forming a silicone ladder polymer film expressed by the following general formula on said semiconductor substrate to cover said element;



(in the formula, n is an integer.)

selectively etching said silicone ladder polymer film by an aromatic organic solvent to expose the surface of said aluminum electrode pad; and

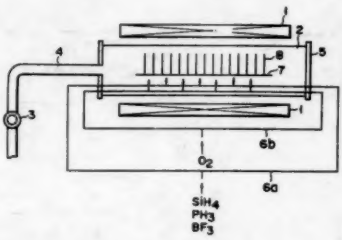
elevating the temperature of said silicone ladder polymer film at a temperature elevating rate of 20° C./min or more, and then, cooling said silicone ladder polymer film at a cooling rate of 20° C./min or more to form a cured stress buffering protective film for buffering a stress applied to said element.

5,180,692

METHOD FOR THE MANUFACTURE OF BORON-CONTAINING FILMS BY CVD OR EPITAXIAL TECHNIQUES USING BORON TRIFLUORIDE

Shigehito Ibuka, Kofu, and Hideki Lee, Nirasaki, both of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Continuation of Ser. No. 504,699, Apr. 5, 1990, abandoned, which is a continuation of Ser. No. 330,269, Mar. 29, 1989, abandoned. This application Oct. 24, 1991, Ser. No. 781,669
Claims priority, application Japan, Mar. 30, 1988, 63-77231
Int. Cl.[5] H01L *21/00, 21/02;* C23C *11/00*
U.S. Cl. 437—240 6 Claims



1. A method for manufacturing boron-containing films, comprising the steps of:

arranging a plurality of semiconductor wafers on a wafer boat such that the surfaces of said wafers to be processed for forming films thereon are exposed;

housing said wafer boat in a process tube made of quartz;

exhausting the inside of said process tube to form a vacuum therein;

heating said wafers in said process tube in a range of 350° C.–430° C.;

introducing a reaction gas composed of BF_3, Si, P and O into said process tube, said reaction gas containing a BF_3 gas component of 5.482–19.187 SCCM per square meter of unit surface area of a wafer to be processed;

allowing said reaction gas to directly react with said wafers; and

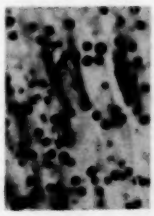
forming borophosphosilicate glass films having resistance to humidity absorption, on said wafers.

5,180,693

PROCESS FOR THE PRODUCTION OF A COMPOSITE OF METAL OXIDES, COMPOSITE POWDERS OF METAL OXIDES AND CERAMIC MATERIALS

Luc Lerot, Brussels; Franz Legrand, Quaregnon, and Joël Bourjot, Brussels, all of Belgium, assignors to Solvay S.A., Brussels, Belgium

Filed Jul. 20, 1990, Ser. No. 556,078
Claims priority, application Belgium, Jul. 20, 1989, 8900797
Int. Cl.[5] C03C *3/00*
U.S. Cl. 501—12 12 Claims



11. The process according to claim 1, wherein said metal oxide particles have a diameter of between 0.05 and 2 microns.

5,180,694

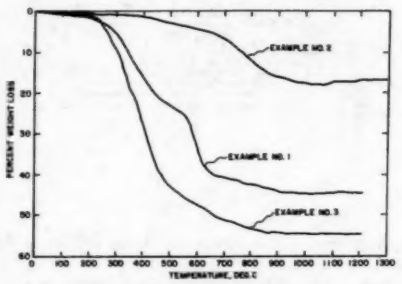
SILICON-OXY-CARBIDE GLASS METHOD OF PREPARATION AND ARTICLES

Gary M. Renlund, Salt Lake City, Utah; Larry N. Lewis, Scotia, N.Y.; Judith Stein, Schenectady, N.Y., and Angelo A. Bracco, Albany, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 428,711, Oct. 30, 1989, abandoned, and a continuation-in-part of Ser. No. 359,619, Jun. 1, 1989, abandoned, and a continuation-in-part of Ser. No. 386,327, Jul. 28, 1989, Pat. No. 4,981,820. This application Aug. 30, 1990, Ser. No. 574,879

Int. Cl.[5] C03C *3/00*

U.S. Cl. 501—12 **54 Claims**



1. A translucent glass comprising silicon, oxygen, and carbon in a distribution of polyatomic units comprising, in weight percent, about 18 to 28 percent tetraoxysilicon, about 21 to 31 percent monocarbosiloxane, about 12 to 22 percent dicarbosiloxane, and about 28 to 38 percent tetracarbosilicon, with up to a trace amount of elemental carbon dispersed in the glass so that the glass permits at least the partial transmission of light through the glass.

5,180,695

LEAD OXIDE-FREE GLASS, PARTICULARLY FOR USE IN ELECTRIC LAMPS

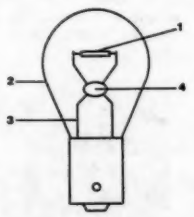
Werner Weiss, Stadtbergen; Manfred Mair, Augsburg; Manfred Deisenhofer, Altenmuenster, and Ewald Poesl, Kissing, all of Fed. Rep. of Germany, assignors to Patent Treuhand Gesellschaft fur Elektrische Gluhlampen m.b.H., Munich, Fed. Rep. of Germany

Filed Jun. 10, 1991, Ser. No. 713,126

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1990, 4018682

Int. Cl.[5] C03C *3/091*

U.S. Cl. 501—66 **14 Claims**



1. A glass body, wherein the glass of the glass body has high electrical resistance,

said glass body consisting essentially of

SiO_2 40–60%

Al_2O_3 2–5%

CaO 5–10%

BaO 20–30%

V_2O_5 2–5%

K_2O 5–7%

B_2O_3 0–5%

wherein all percentages are given by weight.

5,180,696

HIGH-TOUGHNESS ZRO_2 SINTERED BODY AND METHOD OF PRODUCING SAME

Ryoji Inoue, Yasugi, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jun. 6, 1988, Ser. No. 202,668

Claims priority, application Japan, Jun. 11, 1987, 62-145963; Jun. 11, 1987, 62-145964

Int. Cl.[5] C04B *35/56, 35/50, 35/48, 35/10*

U.S. Cl. 501—87 **12 Claims**

1. A high-toughness zirconia-based sintered body consisting essentially of ZrO_2, and 0.1–3 mol % of Nd_2O_3 and 0.5–3.5 mol % of Y_2O_3 as stabilizers of the crystal structure of ZrO_2, said sintered body having a crystal structure comprised of a substantially tetragonal phase or a mixture of a tetragonal phase and a cubic phase with an average crystal grain size of 1 μm or less.

5,180,697

PROCESS FOR PREPARING SELF-SUPPORTING BODIES AND PRODUCTS PRODUCED THEREBY

Terry D. Claar, Newark, Del.; Steven M. Mason, Norwood, Pa.; Kevin P. Pochopien, Newark, Del.; Danny R. White, Elkton, Md.; William B. Johnson, Newark, Del., and Michael K. Aghajanian, Bel Air, Md., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 446,433, Dec. 5, 1989, Pat. No. 5,017,334, which is a continuation of Ser. No. 296,771, Jan. 13, 1989, Pat. No. 4,885,130, which is a continuation-in-part of Ser. No. 137,044, Dec. 23, 1987, Pat. No. 4,940,679, which is a continuation-in-part of Ser. No. 73,533, Jul. 15, 1987, abandoned. This application Jul. 12, 1990, Ser. No. 551,306

The portion of the term of this patent subsequent to Dec. 5, 2006, has been disclaimed.

Int. Cl.[5] C04B *35/65*

U.S. Cl. 501—96 **13 Claims**

MICROFICHE APPENDIX INCLUDED

(051806727 Microfiche, Pages)

1. A method for producing a self-supporting body, comprising:

selecting a parent metal;

heating said parent metal in a substantially inert atmosphere to a temperature above its melting point to form a body of molten parent metal;

contacting said body of molten parent metal with a permeable mass comprising at least one boron donor material, and at least one carbon donor material, wherein the ratio of reactants to parent metal in said permeable mass is controlled in order to modify at least one of the characteristics in the formed self-supporting body selected from the group consisting of grain size, metal content, degree of interconnectivity, porosity and the ratio of reaction products;

maintaining said temperature for a time sufficient to permit infiltration of molten parent metal into said permeable mass and to permit reaction of said molten parent metal with said permeable mass to form at least one boron-containing compound; and

continuing said infiltration and reaction for a time sufficient to produce said self-supporting body comprising at least one parent metal boron-containing compound.

5,180,698

METHOD OF PREPARING REFRACTORY CHROMIUM-CONTAINING MATERIAL

Alexandr G. Merzhanov, Ulitsa Tretya, 3, kv.2, Moskovskaya oblast, poselok Chernogolovka; Georgy I. Xandopulo, Ulitsa Mira, 166, kv.34, Alma-Ata; Mikael D. Nersesian, Institutsky prospekt, 4, kv.120, Moskovskaya Oblast, poselok Chernogolovka; Marat B. Ismailov, 8, Mikroraion, 26, kv.52, Alma-Ata, and Inna P. Borovinskaya, Ulitsa Tretya, 3, kv.2, Moskovskaya oblast, poselok Chernogolovka, all of U.S.S.R.

PCT No. PCT/SU89/00112, § 371 Date Jun. 4, 1991, § 102(e) Date Jun. 4, 1991, PCT Pub. No. WO90/05120, PCT Pub. Date May 17, 1990

PCT Filed Apr. 25, 1989, Ser. No. 687,897

Claims priority, application U.S.S.R., Oct. 31, 1988, 4496508

Int. Cl.[5] C04B *35/42*

U.S. Cl. 501—132 **20 Claims**

1. A method of producing a refractory chromium-containing material comprising preparing an exothermal mixture of a chromium-containing component, a filler and a reducer, and thermally treating the mixture under combustion conditions to form the refractory chromium-containing material, said reducer comprising at least one metal selected from the group consisting of aluminum, magnesium, silicon, zirconium, titanium, and alloys thereof and being present in said mixture in an amount of about 8 to 20% by weight, said filler being selected from the group consisting of periclase, sand, clay, refractory scrap, silicon carbide production waste and an inorganic acid salt and being present in said mixture in an amount of about 0.1 to 50% by weight.

5,180,699

PROCESS FOR PRODUCING POWDER MATERIAL FOR LEAD PEROVSKITE CERAMIC

Yasuhiko Terada, Ashiya; Kazunobu Abe, Izumi; Hajime Uno, Sakai, and Shinichi Shirasaki, Tsukuba, all of Japan, assignors to Sakai Chemical Industry Co., Ltd., Osaka and National Institute for Research in Inorganic Materials, Ibaragi, both of, Japan

Filed Nov. 13, 1990, Ser. No. 611,266

Claims priority, application Japan, Nov. 13, 1989, 1-294183

Int. Cl.[5] C04B *35/46, 35/49, 35/00;* **C01G** *53/00*

U.S. Cl. 501—134 **5 Claims**

1. A process for producing a powder material for lead perovskite ceramics represented by the formula:

$$PbA_xNb_{1-x}O_3$$

wherein x equals $\frac{1}{2}$ or $\frac{1}{3}$ and A represents at least one element selected from the group consisting of Fe, Co, Cr, Ni, Mn, Mg, Zn, Cd, Zr, In, Cu and Hf, said process comprising the steps of calcining a dried mixture of a compound of A and a niobic acid sol at a temperature of about 400°–900° C.; adding a Pb compound to said calcined mixture; and calcining the resultant mixture at a temperature of about 400°–900° C.

5,180,700

REGENERATION AND EXTENSION OF LIFETIME OF DEHYDROGENATION CATALYSTS USED IN THE PREPARATION OF 2-ALKYLPYRIMIDINES

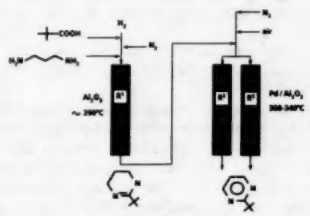
Eva F. Tai; John W. Hull, Jr., and Kenneth E. First, all of Midland, Mich., assignors to DowElanco, Indianapolis, Ind.

Filed May 13, 1991, Ser. No. 698,872

Int. Cl.[5] B01J *23/96, 38/14, 38/18;* **C07D** *239/26*

U.S. Cl. 502—50 **2 Claims**

1. A process for the regeneration of the palladium catalyst used in the dehydrogenation of a 2-alkyl-1,4,5,6-tetrahydropyrimidine to a 2-alkylpyrimidine consisting essentially of: (a) contacting the catalyst first with from 0.01 to 1.0 percent oxygen in an inert carrier gas until the initial exotherm dissipates and then with increasing concentrations of oxygen in an inert carrier gas until no significant exotherm is any longer observed, all the while controlling the temperature between



200 and 350° C.; (b) purging the catalyst with nitrogen; and (c) reducing the catalyst with hydrogen.

5,180,701

PROCESS FOR EXTRUDING CRYSTALLINE ALUMINOSILICATES

Patrick Moureaux, and Jean P. Darnanville, both of Grand Couronne, France, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 16, 1991, Ser. No. 807,351

Claims priority, application France, Dec. 21, 1990, 90 16140

Int. Cl.[5] B01J *29/04, 37/00*

U.S. Cl. 502—64 **14 Claims**

9. A process for preparing crystalline aluminosilicate extrudates from a shapable dough which comprises mixing and kneading a silica source, a dealuminated aluminosilicate zeolite source, water and a trialkanolamine containing at least two carbon atoms per alkanolamine group to obtain a mixture having a total solids content of from about 25% by weight to about 75% by weight, wherein the trialkanolamine is present in an amount of from about 0.5% by weight to about 40% by weight, basis the total solids content of the mixture, and subsequently extruding the mixture.

5,180,702

METAL HALIDE CATALYST, METHOD OF PRODUCING THE CATALYST, POLYMERIZATION PROCESS EMPLOYING THE CATALYST, AND POLYMER PRODUCED BY THE POLYMERIZATION PROCESS

Ted M. Pettijohn, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 11, 1991, Ser. No. 805,233

Int. Cl.[5] C08F *4/654*

U.S. Cl. 502—107 **18 Claims**

1. A process for producing a polymerization catalyst comprising:

(1) contacting at least one metal halide selected from the halides of Group IIA and Group IIB metals, with at least one alcohol to form a metal halide solution;

(2) contacting the solution of (1) with an organometallic compound to form a soluble complex wherein the metal in the organometallic compound is selected from Groups IA, IIA, IIB, and IIIA; and

(3) contacting the soluble complex of (2) with a halide ion exchanging source comprising a group IVA or Group VA transition metal halide to form said catalyst.

5,180,703

SOX/NOX SORBENT AND PROCESS OF USE

Michael S. Ziebarth, Columbia; Michael J. Hager, Baltimore; Jean W. Beeckman, Columbia, and Stanislaw Plecha, Baltimore, all of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Apr. 24, 1991, Ser. No. 690,466
Int. Cl.[5] B01J *20/08, 20/10*
U.S. Cl. 502—243 22 Claims

1. An active ingredient containing stabilized alumina sorbent capable of adsorbing NOx and SOx and other impurities from waste gases and being regenerated by heating above 600° C. comprising stabilized spheroidal alumina particles having

a surface area of about at least 180 square per gram;

a compacted bulk density of about 20 to about 45 pounds per cubic foot;

an average crush strength of at least 4 pounds,

an attrition loss measured by the Air Jet Attrition method of less than 2%;

an alumina stabilizer selected from the group consisting of silica, lanthana, other rare earths, titania, zirconia, clay, alkaline earths and mixtures thereof in an amount from an effective amount up to about 30 mole %; and

an active ingredient of a metal selected from the group consisting of alkali metals, alkaline earth metals and mixtures thereof and present in an amount of from about 1 to 20 wt %,

said sorbent when subjected to the Sorbent Cycle Stability procedure having its surface area dropping less than 60 m^2/g from the 20th to the 100th cycle, and

said sorbent when subjected to the Hydrothermal Stability procedure maintaining a BET surface area of at least 100 m^2/g.

3. An active ingredient containing stabilized alumina sorbent according to claim 1, wherein the active ingredient is sodium present in an amount of from about 4–6 wt %.

5. An active ingredient containing stabilized alumina sorbent according to claim 1, wherein the active ingredient is sodium and the alumina stabilizer is silica.

5,180,704

OIL SORPTION WITH SURFACE-MODIFIED RUBBER

Wilhelm Reindl, St. Paul, and Doil Williams, Ramsey, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 19, 1991, Ser. No. 688,135
Int. Cl.[5] B01J *20/26*
U.S. Cl. 502—402 25 Claims

1. A method for forming an article for sorbing oil, the method comprising:

eliminating a portion of cross-linking of substantially cross-linked polymer particles to form adhesive areas from the particles on at least a portion of outer surfaces of a majority of the particles; and

attaching the particles to each other using the adhesive areas to define interstitial spaces between the attached particles.

5,180,705

TRANSFER IMAGING USING METAL-AZO AND METAL-AZOMETHINE DYES

Terrance P. Smith; David W. Macomber; Jeffrey C. Chang, and Linda K. Williams, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 11, 1991, Ser. No. 667,323
Int. Cl.[5] B41M *5/035, 5/38*
U.S. Cl. 503—227 12 Claims

10. A thermal dye transfer process which comprises the steps of:

(a) contacting the thermal transfer dye-donor sheet of claim 1 with a suitable receptor sheet; and

(b) thereafter, applying heat in an imagewise fashion to said thermal transfer dye-donor sheet whereby the dye is thermally transferred to the receptor sheet.

5,180,706

HIGH-TEMPERATURE POROUS-CERAMIC SUPERCONDUCTORS

Franklin G. Reick, 228 West Pl., Westwood, N.J. 07675

Division of Ser. No. 301,480, Jan. 26, 1989, Pat. No. 4,999,322.
This application Oct. 29, 1990, Ser. No. 604,458
Int. Cl.[5] C04B *41/89;* H01B *12/06;* H01L *39/12;* C01G *3/00*
U.S. Cl. 505—1 4 Claims

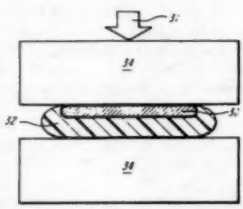
1. A high-temperature copper-oxide ceramic superconductive body having a porous structure defined by interlaced diffusion tunnels that extend throughout the body and communicates with its exterior to facilitate oxygenation of the body during its production and to render it superconductive when the tunnels are thereafter penetrated by a cryogenic coolant that reduces the temperature of the body to a level at which it exhibits superconductive properties.

5,180,707

METHOD FOR SYNTHESIS OF HIGH T_c SUPERCONDUCTING MATERIALS BY OXIDATION AND PRESS COATING OF METALLIC PRECURSOR ALLOYS

Wei Gao, Somerville, and John B. Vander Sande, Newbury, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 8, 1991, Ser. No. 652,528
Int. Cl.[5] B05D *5/12, 3/12*
U.S. Cl. 505—1 32 Claims



1. A method for synthesis of oxide superconductor composites comprising:

preparing a metallic precursor alloy containing metallic constituents of the oxide superconductor and a noble metal;

oxidizing the precursor alloy;

press coating the oxidized precursor onto a substrate at a temperature and pressure sufficient to obtain an adherent oxide superconductor composite; and

reannealing the oxide superconductor composite.

5,180,708

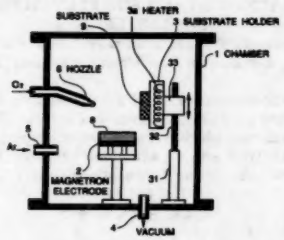
PROCESS AND APPARATUS FOR PREPARING SUPERCONDUCTING THIN FILMS

Keizo Harada; Hisao Hattori, and Hideo Itozaki, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 20, 1991, Ser. No. 717,944
Claims priority, application Japan, Jun. 20, 1990, 2-161993; Jun. 20, 1990, 2-161994
Int. Cl.[5] H01L *39/24;* C23C *14/35*
U.S. Cl. 505—1 12 Claims

1. A process for preparing a thin film of a high-temperature compound oxide superconductor having a large area on a substrate by a magnetron sputtering method, characterized in that a magnetron electrode on which an elongated target is secured has an elongated shape, in that the said substrate also

has an elongated shape and is arranged in such a manner that a surface of said substrate makes a predetermined angle which is



not zero with respect to said surface of said elongated target, and in that said substrate is moved along a direction which is transverse to the elongated dimension of said target.

5,180,709

ACETYL-TRI-AND-TETRAMETHYL-OCTAHYDRONAPHTHALENES AND FRAGRANCE COMPOSITIONS CONTAINING SAME

Franz Etzweiler, Greifensee; Daniel Helmlinger, Gockhausen; Cornelius Nussbaumer, Schwerzenbach, and Mario Pesaro, Zurich, all of Switzerland, assignors to Givaudan-Roure Corporation, Clifton, N.J.

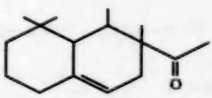
Filed May 31, 1991, Ser. No. 708,662

Claims priority, application European Pat. Off., Jun. 2, 1990, 90110519.7

Int. Cl.[5] A61K *7/46*

U.S. Cl. 512—17 **21 Claims**

1. A compound having the formula



except wherein said compound is present at a level of less than six percent as a component of an isomeric mixture of two or more acetyl-tetramethyl-octahydronaphthalenes.

12. A fragrance composition to which there has been added as a fragrance contributing ingredient an olfactorily effective amount of substantially pure (±)-3α-acetyl-3β,4β,5,5-tetramethyl-2,3,4,4aβ,5,6,7,8-octahydronaphthalene.

5,180,710

ETHYL (2E,4Z,7Z)-2,4,7-DECATRIENOATE AND ITS USE AS A PERFUMING OR FLAVORING INGREDIENT

Ferdinand Naef, Carouge; René Decorzani, Onex; Regula Naef, Carouge; Pierre-Alain Blanc, Crassier, and Nicole van Beem, Dully, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Filed Oct. 8, 1991, Ser. No. 773,054

Claims priority, application Switzerland, Oct. 22, 1990, 3361/90

Int. Cl.[5] A61K *7/46*

U.S. Cl. 512—26 **5 Claims**

1. A perfuming composition with a pear, green, violet leaf type odor character, containing ethyl (2E,4Z,7Z)-2,4,7-decatrienoate as an active perfuming ingredient.

5,180,711

COMBINED TREATMENT WITH GNRH ANTAGONIST AND GNRH TO CONTROL GONADOTROPIN LEVELS IN MAMMALS

Gary D. Hodgen, Norfolk, Va., assignor to Applied Research Systems ARS Holding N.V., Netherlands

Filed Jun. 14, 1990, Ser. No. 538,375

Int. Cl.[5] A61K *37/02, 37/38;* **C07K** *7/06*

U.S. Cl. 514—15 **18 Claims**

1. A method of controlling gonadotropin levels in a mammal for a defined treatment period which comprises administering a gonadotropin releasing hormone (GnRH) antagonist in an amount and frequency effective to substantially suppress endogenous gonadotropin levels in said mammal throughout the treatment period and administering gonadotropin releasing hormone (GnRH) in an amount and frequency effective to induce secretion of gonadotropins to maintain a desired level in said mammal throughout the treatment period.

5,180,712

PETIDE ANTIDEMENTIA AND NOOTROPIC AGENTS

Yoshikazu Isowa; Yoshiaki Sato; Yoshiharu Nakashima, all of Tokyo; Mitsuo Masaki, Chiba; Norihisa Miyake, Saitama; Masaki Uehara, Saitama, and Kenji Hirate, Saitama, all of Japan, assignors to Fujirebio Kabushiki Kaisha and Nippon Chemiphar Co., Ltd., both of Tokyo, Japan

Filed Aug. 14, 1989, Ser. No. 393,572

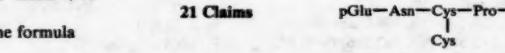
Claims priority, application Japan, Aug. 12, 1988, 63-201358; Aug. 12, 1988, 63-201359

The portion of the term of this patent subsequent to May 12, 2009, has been disclaimed.

Int. Cl.[5] A61K *37/02;* **C07K** *5/10, 7/06*

U.S. Cl. 514—16 **16 Claims**

1. A peptide having the formula (I):



(I)

or its derivative having an amide group at the terminal amino acid moiety, or a pharmaceutically acceptable salt thereof.

5,180,713

STABILIZED LIPOSOME/AMPHOTERCIN B COMPOSITION AND METHOD

Robert Abra, and Francis C. Szoka, both of San Francisco, Calif., assignors to Liposome Technology, Inc., Menlo Park, Calif.

Continuation of Ser. No. 158,404, Feb. 22, 1988, abandoned, which is a continuation of Ser. No. 781,395, Sep. 27, 1985, Pat. No. 4,766,046. This application Dec. 14, 1990, Ser. No. 628,203

The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.

Int. Cl.[5] A61K *31/70, 37/22*

U.S. Cl. 514—31 **1 Claim**

1. A method of administering liposomes containing amphotericin B and having, after a storage period, a selected liposome size distribution in a size range of 0.5 microns or less, comprising:

preparing a suspension of heterogeneously sized lipsomes containign amphotericin B in the lipid phase and, in the aqueous phase, at least about 0.5% w/v of a membrane-stabilizing agent,

reducing the size heterogeneity of the liposome suspension to achieve said selected liposome size distribution,

lyophilizing the liposome suspension before the size distribution of the liposomes changes substantially,

after such storage period, adding an aqueous medium to the lyophilized suspension, said adding being effective to produce a reconstituted suspension of liposomes in which the size distribution achieved by said reducing is substantially preserved, and

administering the reconstituted liposomes before the size distribution of the liposomes changes substantially.

5,180,714

ADENOSINE COMPOUNDS FOR THE TREATMENT OF DISEASES CAUSED BY PARASITIC PROTOZOA

Janice R. Sufrin, Snyder; Cyrus J. Bacchi, E. Northport; Carl W. Porter, East Aurora; Henry Nathan, Riverdale; Arthur J. Spiess, Cheektowaga, and Nigel Yarlett, Elmhurst, all of N.Y., assignors to Health Research, Inc., Buffalo, N.Y.

Filed Oct. 31, 1990, Ser. No. 606,587
Int. Cl.[5] A61K *31/70*
U.S. Cl. 514—46 **9 Claims**

5. A method for treating infections caused by 5'-deoxy-5'-methylthioadenosine (MTA) phosphorylase-containing pathogenic microorganisms which comprises administering a non-toxic, effective amount of an adenosine compound to a human being or an animal in need of such a treatment, wherein said adenosine compound is selected from one or more of the following compounds:

5'-deoxy-5'-(hydroxyethylthio)adenosine (HETA);
5'-deoxy-5'-(monofluoroethylthio)adenosine (MFETA);
5'-deoxy-5'-(chloroethylthio)adenosine (CETA); and
5'-deoxy-5'-(bromoethylthio)adenosine (BETA).

5,180,715

IRRIGATION OF INTERNAL BLADDER SURFACES IN MAMMALS WITH SODIUM PENTOSANPOLYSULFATE

C. Lowell Parsons, San Diego, assignor to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 416,638, Sep. 10, 1982, abandoned, which is a continuation-in-part of Ser. No. 207,206, Nov. 17, 1980, abandoned. This application Jul. 31, 1989, Ser. No. 387,402
Int. Cl.[5] A61K *31/70*
U.S. Cl. 514—54 **11 Claims**

1. A method of treating bladder infections in mammals which comprises irrigating the internal bladder and associated surfaces with an irrigating solution containing an effective amount of sodium pentosanpolysulfate.

5,180,716

CYCLODEXTRIN COMPLEXES FOR NEURAXIAL ADMINISTRATION OF DRUGS

Tony L. Yaksh, San Diego, Calif., and Harlan F. Hill, Seattle, Wash., assignors to The Regents of the University of California, Oakland, Calif.

Filed Aug. 1, 1990, Ser. No. 560,614
Int. Cl.[5] A61K *31/56*; C08B *37/16*
U.S. Cl. 514—58 **21 Claims**

1. A method of delivering an analgesic drug to the neuraxis of a patient, comprising administering said analgesic drug to the neuraxis of said patient in the form of a solution of an inclusion complex between said analgesic drug and a β-cyclodextrin substituted about 15% to about 80% with at least one substituent selected from the group consisting of —OCH_3, —ROH, —RSO_3H, —CO_2R, —NHR, —NR_2, —NROH, and —SiR_3, wherein each R is independently selected from C_{1-10} alkyl groups that may be linear, branched, or cyclic, whereby said inclusion complex is effective to increase bioactivity of said drug, reduce redistribution of said drug from the neuraxis, and reduce systemic toxicity of the drug when compared to delivery of the drug alone to the neuraxis of said patient.

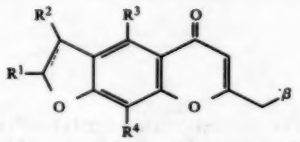
5,180,717

BIVALENT LIGANDS EFFECTIVE FOR BLOCKING ACAT ENZYME FOR LOWERING PLASMA TRIGLYCERIDES AND FOR ELEVATING HDL CHOLESTEROL

Ronald B. Gammill, Portage, and Frank P. Bell, Vicksburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 486,648, Feb. 28, 1990, abandoned, and a continuation-in-part of Ser. No. 651,334, Feb. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 2,572, Jun. 16, 1989, which is a continuation of Ser. No. 232,931, Aug. 16, 1988, abandoned. This application May 7, 1991, Ser. No. 697,301
Int. Cl.[5] A61K *31/445*
U.S. Cl. 514—63 **16 Claims**

1. A bivalent ligand α-β-α wherein α is structurally represented by the formula



or a pharmaceutically acceptable salt thereof wherein:

R^1 and R^2 are independently:
- a) H,
- b) halo,
- c) C_{1-8} alkyl,
- d) —$(CH_2)_p$-aryl,
- e) —$(CH_2)_p$-heteroaryl,
- f) —$(CH_2)_p$—CO_2R^6,
- g) —$(CH_2)_p$—$CONR^7R^8$,
- h) —$Si(R^9)$,
- i) —$(CH_2)_n$—NR^7R^8,
- j) —$(CH_2)_n$—OR^{10},
- k) —CF_3, or
- l) —$(CH_2)_n$—SR^6, —$(CH_2)_n$—SOR^6, —$(CH_2)_n$—SO_2R^6;

R^3 is
- a) OH,
- b) $OCH_2CH{=}CH_2$,
- c) $OCH_2CH(OH)CH_2NHR^6$,
- d) —O—C_{1-8} alkyl,
- e) —O—$(CH_2)_n$—CO_2R^6, or
- f) —O—$(CH_2)_n$—$CONR^7R^8$;

R^4 is
- a) hydrogen,
- b) halo,
- c) NO_2,
- d) NH_2
- e) CF_3,
- f) C_{1-8} alkyl,
- g) aryl,
- h) —S—C_{1-8} alkyl or aryl,
- i) —SO—C_{1-8} alkyl or aryl,
- j) —SO_2—C_{1-8} alkyl or aryl,
- k) R^3, or
- l) —$(CH_2)_n$—NR^7R^8;

R^6 is H, CF_3, alkyl or aryl, Li^+, Na^+, K^+, Ca^{2+} and other pharmaceutically acceptable counter ions for carboxylic acids;

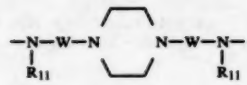
R^7 and R^8 and H, CO-alkyl, CO-aryl, alkyl, cycloalkyl, alkylaryl, aryl, heteroalkyl, aryl, or R^7 and R^8 can be taken together to form a piperidine ring or morpholine ring;

R^9 is an C_{1-8} alkyl or aryl;

R^{10} is H, CF_3, C_{1-8} alkyl, aryl or heteroaryl; and

n is 0-5 and p is 0-8; and

β is



wherein:

W is $-(CH_2)_n-$ where n is 0–5 and

R^{11} is H, C_{1-8} alkyl, CO—C_{1-8} alkyl or CON—C_{1-8} alkyl or -aryl;

where aryl is an aromatic mono or bicyclic, optionally substituted, C_6–C_{12} group;

where heteroaryl is a mono or bicyclic hetero aryl having one N, O, S or two N atoms substituted for one or two carbon atoms;

where heteroalkyl is a 2 to 8 carbon atom alkyl having one N, O, S or two N atoms substituted for one or two carbon atoms.

5,180,718

ACYL DERIVATIVES OF OXAZOLORIFAMYCINS

Wilhelm Kump, Biel-Benken; Christian Borel, Geneva, both of Switzerland; Jen Chen, Sunnyvale, Calif.; Siem J. Veenstra, Basel, Switzerland; John Francis, and Benjamin B. Mugrage, both of Basking Ridge, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

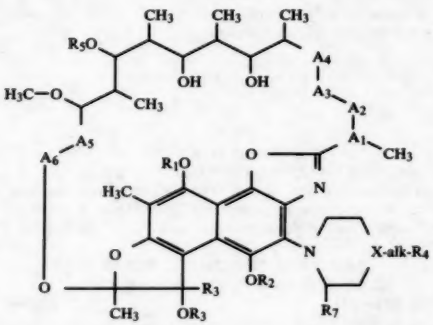
Continuation-in-part of Ser. No. 576,631, Aug. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 485,345, Feb. 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 454,325, Dec. 21, 1989, abandoned. This application Jun. 21, 1991, Ser. No. 718,894

Claims priority, application Switzerland, Mar. 2, 1989, 776/898; European Pat. Off., Dec. 12, 1990, 90810980.4

Int. Cl.[5] C07D *498/18;* A61K *31/495*

U.S. Cl. 514—183 **33 Claims**

1. A compound of the formula I



(I)

in which $-A_1-A_2-$, $-A_3-A_4-$ and $-A_5-A_6-$ each denote ethylene or vinylene, or the elements $-A_1-A_2-$ and $-A_3-A_4-$ each denote ethylene and $-A_5-A_6-$ denotes vinylene; X represents $>C(R_6)-$ or $>N-$, and R_6 denotes hydrogen or C_1–C_7alkyl; alk denotes C_1–C_7alkylene, C_3–C_7alkenylene or C_3–C_7alkynylene; R_1 denotes C_2–C_8alkanoyl, halogen-C_2–C_8alkanoyl, alkoxy-C_2–C_8-alkanoyl, phenyl- or naphthyl-C_2–C_8alkanoyl, benzoyl, naphthoyl, 5- or 6-membered monocyclic monoaza-, monooxa- or monothiaaroyl, C_1–C_7alkoxycarbonyl, phenyl- or naphthyl-C_1–C_7alkoxy-carbonyl, aminocarbonyl which is unsubstituted or mono- or di-substituted by C_1–C_7alkyl, C_1–C_7alkanesulfonyl, halogeno-C_1–C_7alkanesulfonyl, phenyl- or naphthyl-C_1–C_7alkanesulfonyl, C_3–C_7cycloalkanesulfonyl or benzene- or naphthylsulfonyl; R_2 denotes C_2–C_8alkanoyl, halogeno-C_2–C_8alkanoyl, phenyl- or naphthyl-C_2–C_8alkanoyl, benzoyl, naphthoyl, 5- or 6-membered monocyclic monoaza aroyl, 5-membered monocyclic monooxa- or monothiaaroyl, C_1–C_7alkoxycarbonyl, phenyl- or naphthyl-C_1–C_7alkoxy-carbonyl, aminocarbonyl which is unsubstituted or mono- or disubstituted by C_1–C_7alkyl, or C_1–C_7alkanesulfonyl, halogeno-C_1–C_7alkanesulfonyl, phenyl- or naphthyl-C_1–C_7alkanesulfonyl, C_3–C_7cycloalkanesulfonyl or benzene- or naphthylsulfonyl, C_1–C_7alkyl, phenyl- or naphthyl-C_1–C_7alkyl; R_3 and R_3' represent a common bond, or R_3 denotes hydrogen or C_2–C_8alkanoyl, halogeno-C_2–C_8alkanoyl, phenyl- or naphthyl-C_2–C_8alkanoyl, benzoyl, naphthoyl, 5- or 6-membered monocyclic monoaza aroyl, 5-membered monocyclic monooxa- or monothiaaroyl, C_1–C_7alkoxycarbonyl, phenyl- or naphthyl-C_1–C_7alkoxy-carbonyl, aminocarbonyl which is unsubstituted or mono- or di-substituted by C_1–C_7alkyl, or C_1–C_7alkanesulfonyl, halogeno-C_1–C_7alkanesulfonyl, phenyl- or naphthyl-C_1–C_7alkanesulfonyl, C_3–C_7cycloalkylsulfonyl or benzene- or naphthylsulfonyl, and R_3' is hydrogen; R_4 denotes hydrogen, C_3–C_7cycloalkyl, phenyl, biphenylyl or naphthyl; R_5 denotes hydrogen or acetyl; R_7 denotes hydrogen or C_1–C_7alkyl; where the aromatic radicals in each case are unsubstituted or substituted one, two or three times by substituents selected from the group consisting of halogen, C_1–C_7alkyl, C_1–C_7alkoxy, hydroxyl, C_2–C_3alkanoyloxy, trifluoromethyl and nitro; or a pharmaceutically acceptable salt thereof.

5,180,719

ANTIMICROBIAL QUINOLONYL LACTAM ESTERS

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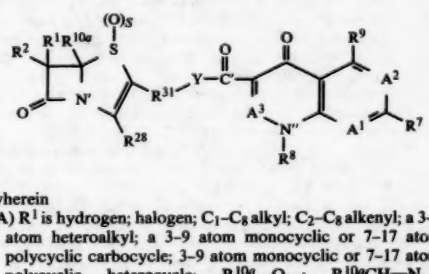
Continuation of Ser. No. 418,033, Oct. 12, 1989, abandoned, which is a continuation-in-part of Ser. No. 261,798, Oct. 24, 1988, abandoned. This application Apr. 29, 1991, Ser. No. 693,790

Int. Cl.[5] C07D *499/88;* A61K *31/43*

U.S. Cl. 514—192 **29 Claims**

1. A compound of the formula



wherein

(A) R^1 is hydrogen; halogen; C_1–C_8 alkyl; C_2–C_8 alkenyl; a 3–8 atom heteroalkyl; a 3–9 atom monocyclic or 7–17 atom polycyclic carbocycle; 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle; R^{10a}—O—; $R^{10a}CH{=}N$—; $(R^{10})(R^{11})N$—; R^{12}—C(=CHR^{15})—C(=O)NH—; R^{12}—C(=NO—R^{14})—C(=O)NH—; or R^{13}—$(CH_2)_m$—C(=O)NH—; wherein said heteroalkyl has carbon atoms and one or two heteroatoms selected from O, S, or N; and wherein said heterocycle has one or more heteroatoms selected from O, S, or N;

(1) m is an integer from 0 to 9;

(2) R^{10} and R^{11} are, independently, R^{10a} where R^{10a} is hydrogen; C_1–C_8 alkyl; C_2–C_8 alkenyl; a 3–9 atom monocyclic or 7–17 atom polycyclic carbocycle or a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle substituent; or R^{10} and R^{11} together form a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle including the nitrogen to which they are bonded; wherein said heterocycles have one or more heteroatoms selected from O, S, or N;

(3) R^{12} is hydrogen; C_1–C_8 alkyl; C_2–C_8 alkenyl; a 3–8 atom heteroalkyl; a 3–8 atom heteroalkenyl; a 3–9 atom monocyclic or 7–17 atom polycyclic carbocycle; or a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle; wherein said heteroalkyl has carbon atoms and one or two hetero-

atoms selected from O, S, or N; wherein said heteroalkenyl has carbon atoms and one or two heteroatoms selected from O, S, or N; and wherein said heterocycles have one or more heteroatoms selected from O, S, or N;

(4) R^{13} is R^{12}, $-Z^1$, or $-CH(Z^2)(R^{12})$;

(5) R^{14} is R^{12}, arylalkyl, heteroarylalkyl, $-C(R^{17})(R^{18})COOH$, $-C(=O)O-R^{12}$, or $-C(=O)NH-R^{12}$, where R^{17} and R^{18} are, independently, R^{12}, or together form a 3–9 atom monocyclic or 7–17 atom polycyclic carbocycle or a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle including the carbon atom to which R^{17} and R^{18} are bonded; wherein said arylalkyl is a C_1–C_8 alkyl substituted with an aryl group substituted with one or two heteroatoms selected from O, S, or N; wherein said heteroarylalkyl is a C_1–C_8 alkyl substituted with an aryl which is substituted with one or two heteroatoms selected from O, S, or N; and wherein said heterocycles have one or more heteroatoms selected from O, S, or N;

(6) R^{15} is R^{14}, halogen, $-Z^1$, or $-CH(Z^2)(R^{12})$;

(7) Z^1 is $-C(=O)OR^{16}$, $-C(=O)R^{16}$, $-N(R^{19})R^{16}$, $-S(O)_pR^{24}$, or $-OR^{24}$; and Z^2 is Z^1 or $-OH$, $-SH$, or $-SO_3H$;

(a) p is an integer from 0 to 2;

(b) R^{19} is hydrogen; C_1–C_8 alkyl; C_2–C_8 alkenyl; a 3–8 atom heteroalkyl; a 3–8 member heteroalkenyl; a 3–9 atom monocyclic or 7–17 atom polycyclic carbocycle; a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle; $-SO_3H$; $-C(=O)R^{20}$; or, when R^{13} is $-CH(Z^2)(R^{12})$ and Z^2 is $-N(R^{19})R^{16}$, R^{19} and R^{16} may together form a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle; wherein said heterocycles have one or more heteroatoms selected from O, S, or N; wherein said heteroalkyl has carbon atoms and one or two heteroatoms selected from O, S, or N; and wherein said heteroalkenyl has carbon atoms and one or two heteroatoms selected from O, S, or N;

(c) R^{20} is R^{12}, $NH(R^{12})$, $N(R^{12})(R^{21})$, $O(R^{21})$, or $S(R^{21})$; where R^{21} is C_1–C_8 alkyl; C_2–C_8 alkenyl; a 3–9 atom monocyclic or 7–17 atom polycyclic carbocycle; a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle; or when R^{20} is $N(R^{12})(R^{21})$, R^{21} and R^{12} may together form a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle; wherein said heterocycles have one or more heteroatoms selected from O, S, or N; and

(8) R^{16} is R^{24} or hydrogen; where R^{24} is C_1–C_8 alkyl; C_2–C_8 alkenyl; arylalkyl; a 3–8 atom heteroalkyl; a 3–8 atom heteroalkenyl; heteroarylalkyl; a 3–9 atom monocyclic or 7–17 atom polycyclic carbocycle; a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle; or, when Z^1 is $N(R^{19})R^{16}$ and R^{16} is R^{24}, R^{16} and R^{19} may together form a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle including the nitrogen atom to which R^{19} is bonded; wherein said heterocycles have one or more heteroatoms selected from O, S, or N; wherein said arylalkyl is a C_1–C_8 alkyl substituted with an aryl group substituted with one or two heteroatoms selected from O, S, or N; wherein said heteroalkyl has carbon atoms and one or two heteroatoms selected from O, S, or N; wherein said heteroalkenyl has carbon atoms and one or two heteroatoms selected from O, S, or N; and wherein said heteroarylalkyl is a C_1–C_8 alkyl substituted with an aryl group substituted with one or more heteroatoms selected from O, S, or N;

(B) R^2 is hydrogen, halogen, alkoxy, or $R^{22}C(=O)NH-$, where R^{22} is hydrogen or C_1–C_8 alkyl;

(C) R^{28} is hydrogen or COOH;

(D) s is an integer from 0 to 2;

(E) R^{31} is nil, C_1–C_8 alkyl, C_2–C_8 alkenyl, a 3–9 atom monocyclic or 7–17 atom polycyclic carbocycle; or a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle; wherein said heterocycles have one or more heteroatoms selected from O, S, N;

(F) Y is 0 or Z^4—R^{34}—O, where

(1) Z^4 is —O—; $-S(O)_t-$, where t is an integer of 0 to 2; or $-NR^{10a}-$;

(2) R^{34} is C_1–C_8 alkyl; C_2–C_8 alkenyl; a 3–8 atom heteroalkyl; a 3–8 atom heteroalkenyl; a 3–9 atom monocyclic or 7–17 atom polycyclic carbocycle; or a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle; wherein said heterocycle has one or more heteroatoms selected from O, S, or N;

(G)

(1) A^1 is N or $C(R^{40})$; where R^{40} is hydrogen, hydroxy, alkoxy, nitro, cyano, halogen, C_1–C_8 alkyl, or $N(R^{10})(R^{11})$;

(2) A^2 is N or $C(R^6)$; where R^6 is hydrogen or halogen;

(3) A^3 is N or $C(R^{41})$; where R^{41} is hydrogen;

(4) R^8 is hydrogen; C_1–C_8 alkyl; a 3–9 atom monocyclic or 7–17 atom polycyclic carbocycle; a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle; alkoxy; hydroxy; C_2–C_8 alkenyl; arylalkyl; or $N(R^{10})(R^{11})$; wherein said arylalkyl is a C_1–C_8 alkyl substituted with an aryl group substituted with one or two heteroatoms selected from O, S, or N; and wherein said heterocycle has one or more heteroatoms selected from O, S, or N;

(5) R^7 is hydrogen, halogen, C_1–C_8 alkyl, a 3–9 atom monocyclic or 7–17 atom polycyclic carbocycle; or a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle; wherein said heterocycle has one or more heteroatoms selected from O, S, or N;

(7) R^9 is hydrogen, halogen, nitro, or $N(R^{10})(R^{11})$;

(H) except that

(1) when A^1 is $C(R^{40})$, R^8 and R^{40} may together form a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle including N'' and A^1; wherein said heterocycle has one or more heteroatoms selected from O, S, or N;

(2) when A^2 is $C(R^6)$, R^6 and R^7 may together form $-O-(CH_2)_n-O-$, where n is an integer from 1 to 4; and

(3) when A^3 is $C(R^{41})$, R^8 and R^{41} may together form a 3–9 atom monocyclic or 7–17 atom polycyclic heterocycle including N'' and the adjacent carbon to which R^{41} is bonded; wherein said heterocycle has one or more heteroatoms selected from O, S, or N;

and pharmaceutically-acceptable salts and biohydrolyzable esters thereof, and hydrates thereof.

5,180,720

2- AND 3-ALKOXY OR HYDROXY-8-SUBSTITUTED-DIBENZ[B,F]-[1,5

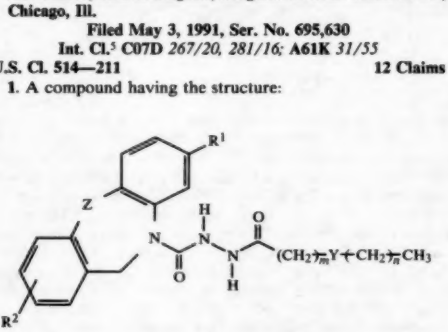
Robert K. Husa, Vernon Hills; E. Ann Hallinan, Evanston, both of Ill.; Michel Lesne, Kraainem, and Marc Herin, Montignies sur Sambre, both of Belgium, assignors to G. D. Searle & Co., Chicago, Ill.

Filed May 3, 1991, Ser. No. 695,630

Int. Cl.[5] C07D *267/20, 281/16;* **A61K** *31/55*

U.S. Cl. 514—211 **12 Claims**

1. A compound having the structure:

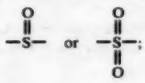


or a pharmaceutically-acceptable salt thereof, wherein:

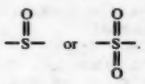
R^1 is: hydrogen or halogen;

R^2 is: hydroxy or alkoxy;

Z is: oxygen, sulfur,



m is: an integer of from 1 to 4;
n is: an integer of from 1 to 4; and
Y is: sulfur,



11. A method for treating pain in a mammal comprising administering to said mammal a therapeutically-effective amount of a compound of claim **1**.

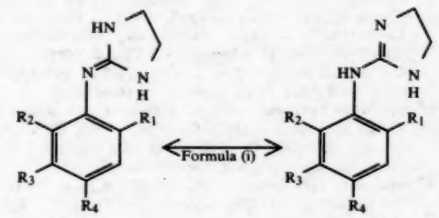
5,180,721

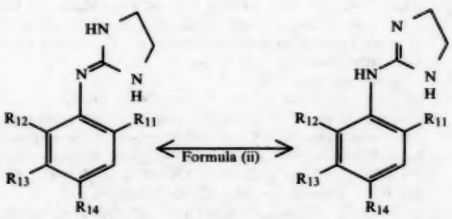
COMBINATIONS OF SELECTIVE ALPHA-ADRENERGIC AGONISTS AND ANTAGONISTS USEFUL IN LOWERING INTRAOCULAR PRESSURE

James A. Burke, Tustin, Calif., assignor to Allergan, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 354,969, May 22, 1989, Pat. No. 5,021,410. This application May 30, 1991, Ser. No. 709,915
The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.
Int. Cl.[5] A61K *31/55, 31/415*
U.S. Cl. 514—213 **4 Claims**

1. A method for lowering intraocular pressure (IOP) comprising co-administering to the eye of a mammal suffering from ocular hypertension a therapeutic amount of alpha$_2$ agonist and alpha$_3$ antagonist wherein the amount of alpha$_3$ potentiates the ocular hypotensive effect of the alpha$_2$ agonist, and wherein the alpha$_2$ agonist is a compound selected from compounds having tautomeric formulae (i), (ii) and (iii)





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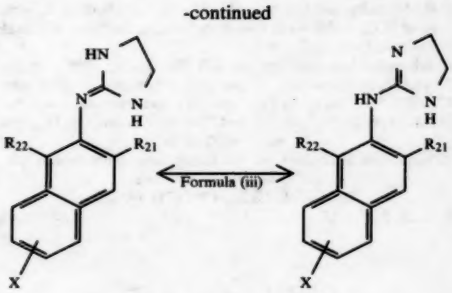
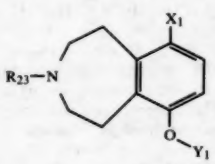


where in Formulae (i) R_1 and R_2 independently are C_{1-6} alkyl, fluoro, chloro, bromo or trifluoromethyl; and one of R_3 and R_4 is hydrogen and the other is selected from $-N(R_5,R_7)$, $-COOR_5$, $-CO-N(R_5,R_6)$, $-NR_5COR_6$, $-CH_2OH$; —CN, OH, $-OCOR_8$, COR_8, $-C(R_8)NOH$, CHNOH, CHO, CHA and CR_8A where R_5 and R_6 independently are hydrogen or C_{1-6} alkyl, R_7 is hydrogen, C_{1-6} alkyl, 2-hydroxyethyl, 2-hydroxypropyl or 3-hydroxypropyl, R_8 is C_{1-6} alkyl and A represents two alkyl groups, each of which independently has 1 to 6 carbons, or A represents $(CH_2)_n$ where n is an integer between 2 to 5;

in Formulae (ii) R_{11} is C_{1-6} alkyl, fluoro, chloro, bromo or trifluoromethyl; R_{12} is hydrogen; R_{13} is selected from OH, $-N(R_9,R_{10})$ and $-NR_9COR_9$; and R_{14} is hydrogen, C_{1-6} alkyl, fluoro, chloro, bromo or trifluoromethyl where R_9 is hydrogen or C_{1-6} alkyl, R_{10} is hydrogen, C_{1-6} alkyl, hydroxymethyl, 2-hydroxyethyl, 2-hydroxypropyl or 3-hydroxypropyl;

in Formulae (iii) R_{21} and R_{22} are independently H, C_{1-6} alkyl, fluoro, chloro, bromo or trifluoromethyl, and where X represents either one nitrogen atom to form together with the benzene ring a quinoline ring, or X represents two nitrogen atoms in 1,4 position relative to one another to form together with the benzene ring a quinoxaline ring, or a pharmaceutically acceptable salt of said alpha$_2$ agonist compound;

and said alpha$_3$ antagonist is a compound of the formula:



wherein:

R_{23} is C_{1-5} alkyl;

X_1 is Br, Cl, or F;

Y_1 is $-CH_2-CH=C(CH_3)_2$, $-CH=CH-CH_3$, $-CH_2-(CH_3)C=CH_2$, $-CH=C(CH_3)_2$, $-CH=CH-CH_2-CH_3$, $-CH=CH-CH(CH_3)_2$; or a pharmaceutically acceptable salt or hydrate of said alpha$_3$ antagonist compound.

5,180,722

10,11-METHYLENEDIOXY-20(RS)-CAMPTOTHECIN AND 10,11-METHYLENEDIOXY-20(S)-CAMPTOTHECIN ANALOGS

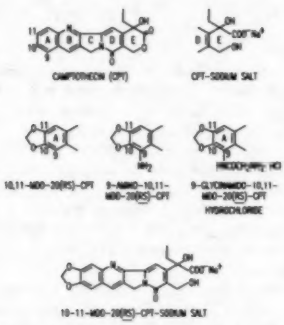
Monroe E. Wall, Chapel Hill; Mansukh C. Wani, Durham; Allan W. Nicholas, and Govindarajan Manikumar, both of Raleigh, all of N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 407,779, Sep. 15, 1989, Pat. No. 5,049,668, and a continuation-in-part of Ser. No. 511,953, Apr. 17, 1990, Pat. No. 5,053,572, which is a continuation of Ser. No. 38,157, Apr. 14, 1987, abandoned. This application Sep. 13, 1990, Ser. No. 581,916

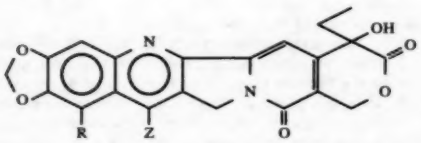
The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.

Int. Cl.[5] **A61K** *31/47*; **C07D** *491/22*

U.S. Cl. 514—219 **30 Claims**



1. A 20(S) or 20(RS)-camptothecin having the structure shown below:



wherein Z is hydrogen or C_{1-8} alkyl, R is NO_2, NH_2, N_3, hydrogen, halogen, COOH, OH, O—C_{1-3} alkyl, SH, S—C_{1-3} alkyl, CN, CH_2NH_2, NH—C_{1-3} alkyl, CH_2—NH—C_{1-3} alkyl, $N(C_{1-3}$ alkyl$)_2$, $CH_2N(C_{1-3}$ alkyl$)_2$, O—, NH— or S—$CH_2CH_2N(CH_2CH_2OH)_2$, O—, NH— or S—$CH_2CH_2CH_2N(CH_2CH_2H)_2$, O—, NH— or S—$CH_2CH_2N(CH_2CH_2CH_2OH)_2$, O—, NH— or S—$CH_2CH_2CH_2N(CH_2CH_2CH_2CH_2OH)_2$, O—, NH— or S—$CH_2CH_2N(C_{1-3}$ alkyl$)_2$, O—, NH— or S—$CH_2CH_2CH_2N(C_{1-3}$ alkyl$)_2$, CHO, C_{1-3} alkyl or $NHCOCHR^1NR^2R^3$, where R^1 is the side-chain of an α-amino acid and R^2 and R^3, independently, are hydrogen or a lower alkyl group or R^3 is a peptide unit containing 1–3 amino acid units bonded to the nitrogen through a peptide bond; NHCO—C_{2-8}-alkylene—X or NHCO—C_{2-8}-alkenyalene—X, where X is COOH; $CONR^2$—$(CH_2)_n$—NR^2R^3, where n=1–10 and R^2 and R^3 are as defined above; NHCO—B—$(CH_2)_n$—NR^2R^3, where B=oxygen or NH; or

where $m+y=3$–6, with the proviso that R and Z are not both hydrogen, and salts thereof.

29. A method of inhibiting the enzyme topisomerase I, comprising contacting said enzyme with an inhibitory amount of the camptothecin of claim **1**.

5,180,723

CERTAIN SULFONAMIDE HETEROBICYCLIC PLATELET ACTIVATING FACTOR ANTAGONISTS

Mark Whittaker; Andrew Miller, both of Oxford, and Stephen A. Bowles, Hertfordshire, all of England, assignors to British Bio-Technology Limited, Oxford, England

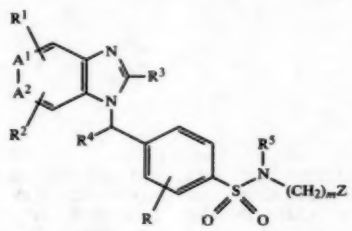
Filed Aug. 15, 1991, Ser. No. 746,246

Claims priority, application United Kingdom, Aug. 15, 1990, 9017878; Aug. 16, 1990, 9018040; Jun. 6, 1991, 9112214

Int. Cl.[5] **C07D** *471/04*; **A61K** *31/435*

U.S. Cl. 514—234.2 **20 Claims**

1. A compound of formula I;



I

wherein:

A^1 is =N—, =CH— or $=CR^1$—;

A^2 is =N—, =CH— or $=CR^2$—;

providing that one of A^1 and A^2 is a nitrogen atom and the other of A^1 and A^2 is other than a nitrogen atom;

R represents hydrogen, —C_1–C_6 alkyl, —C_2–C_6 alkenyl, —C_2–C_6 alkynyl, halogen or —OC_1—C_6 alkyl;

R^1 and R^2 each independently represents hydrogen, —C_1–C_6 alkyl, —C_2—C_6 alkenyl, —C_2—C_6 alkynyl, halogen, —CN, —CO_2H, —CO_2C_1–C_6 alkyl, —$CONH_2$, —CHO, —CH_2OH, —CF_3, —OC_1–C_6 alkyl, —SC_1–C_6 alkyl, —SOC_1–C_6 alkyl, —SO_2C_1–C_6 alkyl, —NH_2, —NHCOMe or —NO_2, or R^1 and R^2 together with the carbon atoms to which they are attached form a fused phenyl ring;

R^3 represents hydrogen, —C_1–C_6 alkyl, —C_2–C_6 alkenyl, —C_2–C_6 alkynyl, —OC_1–C_6 alkyl, —SC_1–C_6 alkyl, —(C_1–C_6 alkyl)OC_1–C_6 alkyl, —(C_1–C_6 alkyl)SC_1–C_6 alkyl, —CF_3, —(C_1–C_6 alkyl)phenyl, —C_3–C_8 cycloalkyl, —C_4–C_8 cycloalkenyl, —(C_1–C_6 alkyl)C_3–C_8 cycloalkyl, —(C_1–C_6 alkyl)C_4–C_8 cycloalkenyl or thiophenyl;

R^4 represents hydrogen, —C_1–C_6 alkyl, —C_2–C_6 alkenyl, —C_2–C_6 alkynyl, —CO_2C_1–C_6 alkyl, —SC_1–C_6 alkyl, —(C_1–C_6 alkyl)SC_1–C_6 alkyl, —(C_1–C_6 alkyl)OC_1–C_6 alkyl, —(C_1–C_6 alkyl)phenyl or thiophenyl;

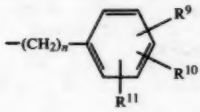
R^5 represents hydrogen, —C_1–C_6 alkyl, —C_2–C_6 alkenyl, —C_2–C_6 alkynyl, —COC_1–C_6 alkyl, —CO_2C_1–C_6 alkyl, —(CO_2C_1–C_6 alkyl)phenyl, —(C_1–C_6 alkyl)CO_2C_1–C_6 alkyl, —(C_1–C_6 alkyl)phenyl, —C_3–C_8 cycloalkyl, —C_4–C_8 cycloalkenyl or phenyl optionally substituted by one or more substituents selected from —C_1–C_6 alkyl, —OC_1–C_6 alkyl, halogen, —CF_3, —CN;

m is an integer from 0 to 3;

Z is either a —$CR^6R^7R^8$ or —CR^6=CR^7R^8 group;

wherein each of R^6, R^7, and R^8 independently represents hydrogen, halogen, —C_1–C_{18} alkyl optionally substituted by one or more halogen atoms, —C_2–C_{18} alkenyl, —C_2–C_{18} alkynyl, —(C_1–C_6 alkyl) OC_1–C_{18} alkyl, —(C_1–C_6 alkyl)SC_1–C_{18} alkyl, —(C_1–C_6 alkyl)O(C_1–C_6 alkyl)OC_1–C_6 alkyl, —(C_1–C_6 alkyl)S(C_1–C_6 alkyl)OC_1–C_6 alkyl, —(C_1–C_6 alkyl)O(C_1–C_6 alkyl)SC_1–C_6 alkyl, —(C_1–C_6

alkyl)S(C_1–C_6 alkyl)SC_1–C_6 alkyl, —(C_1–C_6 alkyl)OC_2–C_6 alkenyl, —C_3–C_8 cycloalkyl, —C_4–C_8 cycloalkenyl, —(C_1–C_6 alkyl)C_3–C_8 cycloalkyl, —(C_1–C_6 alkyl)C_4–C_8 cycloalkenyl, —(C_1–C_6 alkyl)OC_3–C_8 cycloalkyl, —(C_1–C_6 alkyl)OC_4–C_8 cycloalkenyl, —(C_1–C_6 alkyl)SC_3–C_8 cycloalkyl, —(C_1–C_6 alkyl)SC_4–C_8 cycloalkenyl, —(C_1–C_6 alkyl)N(C_1–C_6 alkyl)$_2$, —(C_1–C_6 alkyl)morpholino, —(C_1–C_6 alkyl)OCH_2Ph, —CH_2OSi(C_1–C_6 alkyl)$_3$, —CH_2OSiPh_2C_1–C_6 alkyl or a group —D wherein D represents a group;



wherein n is an integer from 0 to 3, and each of R^9, R^{10} and R^{11} is independently hydrogen, —C_1–C_6 alkyl, —OC_1–C_6 alkyl, —SC_1–C_6 alkyl, —N(C_1–C_6 alkyl)$_2$, —C_2—C_6 alkenyl, —C_2—C_6 alkynyl, —OCH_2Ph, halogen, —CN, —CH_3, —CO_2H, —CO_2C_1–C_6 alkyl, —$CONH_2$, —CONHC_1–C_6 alkyl, —CONH(C_1–C_6 alkyl)$_2$, —CHO, —NH_2, —NHCOC_1–C_6 alkyl, —SOC_1–C_6 alkyl, or —SO_2C_1–C_6 alkyl;

or a pharmaceutically or veterinarily acceptable acid addition salt or hydrate thereof.

5,180,724

CARBOXAMIDE AMINO ACID HETEROBICYCLIC PAF ANTAGONISTS

Stephen A. Bowles, Tring; Mark Whittaker, Old Marston, and Andrew Miller, Headington, all of England, assignors to British Bio-Technology Limited, Oxford, England

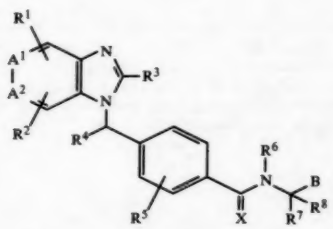
Filed Sep. 16, 1991, Ser. No. 760,174

Claims priority, application United Kingdom, Apr. 9, 1991, 9107398

Int. Cl.[5] **C07D** *471/04, 235/08;* **A61K** *31/435, 31/415*

U.S. Cl. 514—248 **19 Claims**

1. A compound of formula I;



I

wherein:

A^1 is =N—, =CH— or =CR^1—;

A^2 is —N=, —CH= or —CR^2=;

each of R^1 and R^2 independently represents hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, halogen, CN, CO_2H, CO_2C_1–C_6 alkyl, $CONH_2$, CHO, CH_2OH, CF_3, C_1–C_6 alkoxy, C_1–C_6 alkylthio, SOC_1–C_6 alkyl, SO_2C_1–C_6 alkyl, NH_2, NHCOMe or NO_2 or R^1 and R^2 together with the carbon atoms to which they are attached form a fused phenyl ring;

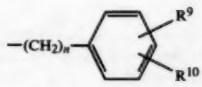
R^3 represents hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, Cl-C6 alkoxy, C_1–C_6 alkylthio, C_1–C_6 alkoxy (C_1–C_6 alkyl), C_1–C_6 alkylthio (C_1–C_6 alkyl), CF_3, phenyl (C_1–C_6 alkyl), C_3–C_8 cycloalkyl or thiophenyl;

R^4 represents hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, CO_2C_1–C_6 alkyl, C_1–C_6 alkylthio, C_1–C_6 alkylthio (C_1–C_6 alkyl), C_1–C_6 alkoxy (C_1–C_6 alkyl), phenyl (C_1–C_6 alkyl) or thiophenyl;

R^5 represents hydrogen, C_1–C_6 alkyl, C_2–C^6 alkenyl, halogen or C_1–C_6 alkoxy;

X represents an oxygen or a sulphur atom;

R^6 represents hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, COC_1–C_6 alkyl, C_1–C_6 alkoxy (C_1–C_6 alkyl), C_3–C_8 cycloalkyl, C_4–C_8 cycloalkenyl or a group D wherein D represents a group:



wherein n is an integer from 0 to 3, and each of R^9 and R^{10} is independently hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, halogen, CN, CO_2H, CO_2C_1–C_6 alkyl, $CONH_2$, CHO, CH_2OH, CF_3, C_1–C_6 alkoxy, C_1–C_6 alkylthio, SOC_1–C_6 alkyl, SO_2C_1–C_6 alkyl, NH_2 or NHCOMe;

or R^6 together with R^7 and the atoms to which they are attached forms a 5 to 8 membered nitrogen-containing heterocyclic ring;

each of R^7 and R^8 independently represents hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, CO_2C_1–C_6 alkyl (C_1–C_6 alkyl), C_1–C_6 alkylthio (C_1–C_6 alkyl), C_1–C_6 alkoxy (C_1–C_6 alkyl), benzoxy (C_1–C_6 alkyl), a side chain of a naturally occurring amino acid or a group D as defined above;

or R^7 together with R^8 and the atoms to which they are attached forms a 5 to 8 membered nitrogen-containing heterocyclic ring;

or R^7 and R^8 together with the carbon atom to which they are attached form a C_3–C_8 cycloalkyl ring;

B represents a) a ZR^{11} group wherein Z is —C(=O)—, —C(=O)O—, —CH_2O—, —CH_2OC(=O)—, —C(=S)—, —C(=S)O— or —CH_2S— and R^{11} is C_1–C_{18} alkyl, C_2–C_{18} alkenyl, C_1–C_6 alkoxy (C_1–C_6 alkyl), C_1–C_6 alkylthio (C_1–C_6 alkyl), C_1–C_6 alkoxy ($CH_2CH_2OCH_2CH_2$), C_3–C_8 cycloalkyl, C_4–C_8 cycloalkenyl, pyridyl or a group D as defined above;

b) a $CH_2NR^{12}R^{13}$ group or a $CONR^{12}R^{13}$ group wherein each of R^{12} and R^{13} is independently hydrogen, C_1–C_6 alkyl, C_3–C_8 cycloalkyl, pyridyl, a group D as defined above or R^{12} and R^{13} together with the nitrogen atom to which they are attached form a 5 to 8 membered nitrogen-containing heterocyclic ring;

c) a 5- or 6-membered aromatic heterocyclic ring containing one or more heteroatoms selected from nitrogen, oxygen and sulphur and the ring may be optionally substituted with one or more substituents selected from C_1–C_6 alkyl, C_1–C_6 alkoxy, halogen, CF_3 and CN;

5,180,725

QUINOXALINYL/QUINOXALIY; ALKYL-N-TERMINAL AMINO HYDROXY

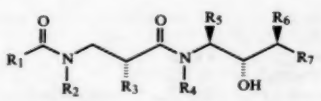
Gunnar J. Hanson, Skokie; John S. Baran, Winnetka; Dave Weissing, Lisle, and Mark Russell, Skokie, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 445,257, Dec. 4, 1989, abandoned. This application Aug. 2, 1991, Ser. No. 739,550

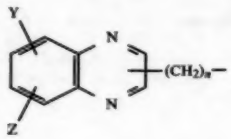
Int. Cl.[5] **A61K** *31/495;* **C07D** *241/36*

U.S. Cl. 514—249 **15 Claims**

1. Compound of the formula



wherein R_1 is selected from heteroaryl and heteroaralkyl groups represented by



wherein each of Y and Z is independently selected from hydrido, lower alkyl, hydroxy, halo, alkoxy, carboxy, amino, alkylamino, dialkylamino, aryl, sulfhydryl and thioalkyl; wherein n is a number selected from zero through five, inclusive; wherein each of R_2 and R_4 is independently selected from hydrido and lower alkyl; wherein R_3 is selected from hydrido, alkyl, benzyl, cycloalkyl, cycloalkylalkyl, alkoxyalkyl and alkylthioalkyl; wherein R_5 is selected from cycloalkyl, phenyl, lower alkyl, cycloalkylalkyl and phenyalkyl; wherein R_6 is selected from hydrido, hydroxy, alkoxy, amino, alkylamino, dialkylamino, lower alkyl and cycloalkyl; wherein R_7 is selected from hydrido, alkyl, haloalkyl, cycloalkylalkyl, alkylcycloalkyl, alkylcycloalkenyl and alkyoxycarbonyl; wherein R_6 and R_7 may further be taken together to form a carbocyclic ring consisting of from three to about eight ring members; and wherein any of the foregoing R_1 through R_7 substituents having a substitutable position may be substituted with one or more groups selected from alkyl, alkoxy, halo, haloalkyl, alkenyl, alkynyl and cyano; or a pharmaceutically-acceptable salt thereof.

5,180,726

4-[4- OR 6-(TRIFLUOROMETHYL-2-PYRIDINYL)]-1-PIPERAZINYLALKYL SUBSTITUTED LACTAMS

Patrick Carlier, Chatel-Guyon; Michel Combourieu, Cebazat; Claude Poisson, Riom, and André J. Monteil, Chatel-Guyon, all of France, assignors to Akzo N.V., Arnhem, Netherlands

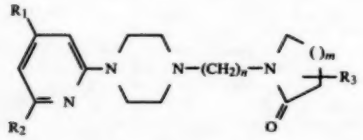
Filed Oct. 17, 1991, Ser. No. 777,963

Claims priority, application European Pat. Off., Oct. 23, 1990, 90402980.8

Int. Cl.[5] A61K *31/495*; **C07D** *401/14*

U.S. Cl. 514—252 **6 Claims**

1. A 4-[4- or 6-trifluoromethyl)-2-pyridinyl]-1-piperazinylalkyl substituted lactam derivative having the structure:



wherein one of the groups R_1 and R_2 is $CF_3$and the other is hydrogen or CF_3;

R_3 is hydrogen or (1–4 C) alkyl;

n is an integer from 4 to 5; and

m is an integer from 1 to 2; or a pharmaceutically acceptable salt thereof.

5,180,727

PHENOXYALKYL-SUBSTITUTED HETEROAROMATICS AND THEIR USE FOR CONTROLLING PESTS

Joachim Leyendecker, Ladenburg; Hans-Juergen Neubauer, Muenster-Hiltrup; Uwe Kardorff, Mannheim; Christoph Kuenast, Otterstadt; Peter Hofmeister, Neustadt, and Wolfgang Krieg, Weingarten, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

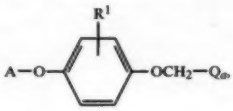
Division of Ser. No. 606,813, Oct. 31, 1990, Pat. No. 5,132,308, which is a division of Ser. No. 389,815, Aug. 4, 1989, Pat. No. 4,996,216. This application Feb. 13, 1992, Ser. No. 834,839

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1988, 3826681; Aug. 5, 1988, 3826682

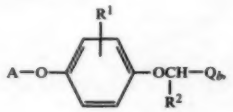
Int. Cl.[5] A01N *43/60*; **C07D** *417/12, 413/12, 403/12*

U.S. Cl. 514—255 **6 Claims**

1. A compound of the formula Ia or Ib



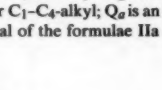
(Ia)



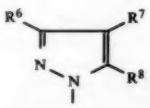
(Ib)

where A is

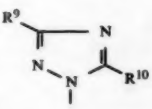
where the radicals R^{13} are identical or different and are each hydrogen, halogen, C_1–C_4-alkyl, C_1–C_3-haloalkyl, C_1–C_4-alkoxy, C_1–C_3-haloalkoxy, C_3–C_6-cycloalkyl, cyano or nitro and n is from 1 to 4, R^1 is hydrogen, halogen or C_1–C_3-alkyl; R^2 is hydrogen or C_1–C_4-alkyl; Q_a is an unsubstituted or substituted azole radical of the formulae IIa to IIe



(IIa)



(IIb)



(IIc)

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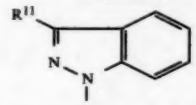
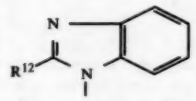


(IId)



(IIe)

where R^3 to R^{12} are hydrogen, halogen, C_1–C_8-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_3–C_{10}-cycloalkyl or are phenyl or naphthyl which is unsubstituted or mono- to trisubstituted by halogen, C_1–C_8-alkyl, C_1–C_8-alkoxy, C_1–C_4-haloalkyl or C_1–C_3-haloalkoxy, and Q_b is a heteroaromatic radical selected from the group consisting of thiophen-2-yl; thiophen-3-yl; thiazol-2-yl; thiazol-4-yl; thiazol-5-yl; oxazol-2-yl; oxazol-4-yl; oxazol-5-yl; imidazol-2-yl; imidazol-4-yl; imidazol-5-yl; isothiazol-3-yl; isothiazol-4-yl; isothiazol-5-yl; pyrazol-3-yl; pyrazol-4-yl; isoxazol-3-yl; isoxazol-5-yl; 1,3,4-thiadiazol-2-yl; 1,3,4-oxadiazol-2-yl; 1,2,4-oxadiazol-3-yl; 1,3,4-triazol-2-yl; and 1,2,4-thiadiazol-3-yl and is unsubstituted or mono- or polysubstituted by halogen, C_1–C_8-alkyl, C_2–C_8-alkenyl, C_1–C_4-haloalkyl, C_1–C_8-alkoxy, C_1–C_8-alkylthio, C_2–C_8-alkoxyalkyl or C_3–C_{10}-cycloalkyl.

5,180,728

PYRIMIDOINDOLE DERIVATIVES AND PROCESSES FOR PREPARATION THEREOF

Masayuki Kato, Kyoto; Shigetaka Nishino, Osaka; Kiyotaka Ito, Ikeda, and Hisashi Takasugi, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

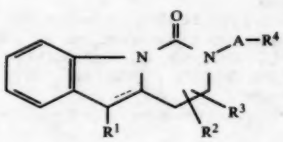
Filed Aug. 27, 1990, Ser. No. 572,247

Claims priority, application United Kingdom, Sep. 25, 1989, 8921634; Jul. 30, 1990, 9016704

Int. Cl.[5] A61K *31/505;* **C07D** *403/06*

U.S. Cl. 514—267 **9 Claims**

1. A compound of the formula:



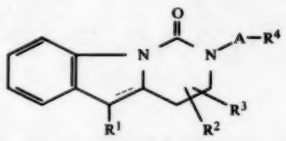
wherein R^1, R^2, and R^3 are each hydrogen, lower alkyl, lower alkenyl, C_{6-10} aryl or C_{6-10} ar(lower)alkyl,

R^4 is imidazolyl which is a 1H-imidazolyl or 1H-imidazolyl having an imino protective group as a substituent in the 1 position, each of which may have lower alkyl as substituent(s), the number of substituents including the imino protective group being 1 to 3, or is pyridyl,

A is lower alkylene, and

is single bond or double bond, and pharmaceutically acceptable salts thereof.

9. A method for treating or preventing nausea or vomiting mediated by 5-hydroxytryptamine which comprises administering a compound of the following formula



wherein R^1, R^2 and R^3 are each hydrogen, lower alkyl, lower alkenyl, C_{6-10}aryl or C_{6-10}ar(lower)alkyl, R^4 is 1H-imidazolyl which may have 1 to 3 lower alkyl as substituent(s) or is pyridyl,

A is lower alkylene, and

is a single bond or double bond

or pharmaceutically acceptable salt thereof in an amount effective to perform as a 5-hydroxytryptamine antagonist to human being or animals in need of such treatment or preventive administration.

5,180,729

USE OF SIGMA RECEPTOR ANTAGONISTS FOR TREATMENT OF COCAINE ABUSE

Leonard Cook, Newark, Del., assignor to Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Filed Feb. 22, 1991, Ser. No. 659,444

Int. Cl.[5] A61K *31/445, 31/505, 31/44, 31/21*

U.S. Cl. 514—317 **33 Claims**

1. A method of treating cocaine abuse or addiction by attenuating the pharmacological effects of cocaine in a mammal which comprises administering to the mammal in need of such treatment an effective amount of a sigma receptor antagonist lacking or having relatively weak dopamine receptor-blocking activity, to reduce the pharmacological effects of the cocaine.

5,180,730

HETEROCYCLIC COMPOUNDS

Toshiyasu Mase, Chiba; Ryuji Tsuzuki, Tokyo; Hiromu Hara, Saitama; Kiyoshi Murase, Saitama, and Kenichi Tomioka, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

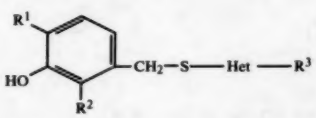
Continuation of Ser. No. 491,356, Mar. 9, 1990, abandoned, which is a division of Ser. No. 228,542, Aug. 4, 1988, Pat. No. 4,933,348, which is a division of Ser. No. 885,085, Jul. 14, 1986, Pat. No. 4,803,211. This application Apr. 5, 1991, Ser. No. 682,867

Claims priority, application Japan, Jul. 22, 1985, 60-164267; Oct. 7, 1985, 60-224197; Dec. 26, 1985, 60-297097

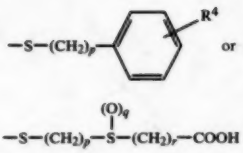
Int. Cl.[5] C07D *213/62;* **A61K** *31/44*

U.S. Cl. 514—348 **5 Claims**

1. A heterocyclic compound represented by the formula:



wherein R^1 represents a C_1–C_6 alkanoyl group; R^2 represents a lower alkyl group; Het represents a pyridine ring; R^3 represents a carboxy group, an amino group, a lower alkylamino group, a carboxy lower alkylamine group, a lower alkanoylamino group, a carboxy lower alkanoylamino group, a di-lower alkylamino group, a hydroxy group, a lower alkoxy group, a carboxy lower alkoxy group, a mercapto group, a lower alkylthio group, a carboxy lower alkylthio group, a group represented by the formulas:



wherein p represents an integer of 1 to 5, q represents 0, 1 or 2, r represents an integer of 1 to 5; R^4 represents a carboxy group, a lower alkoxy group, a carboxy lower alkoxy group, a lower alkyl group, or a carboxyl lower alkyl group and each, except for the carboxy group, may have a sulfur atom or an oxygen atom between two carbon atoms in the carbon chain thereof); provided that when the compound is substituted by a carboxy group, said carboxy group may be in the form of a lower alkyl ester, a phenyl lower alkyl ester, a lower alkoxy phenyl lower alkyl ester, or a pharmacologically acceptable non-toxic acid addition salt.

5,180,731

AMINOAZOLE DERIVATIVES AND THEIR PRODUCTION AND USE

Yukinori Ozato, Takarazuka; Nobuhiko Tamura, Toyonaka; Hiroaki Masamori, Ibaraki; Michihiro Yamamoto, Nishinomiya; Atsuyuki Kojima, Takarazuka; Fumio Nishikaku, Itami, and Yoshihiko Kimura, Osaka, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

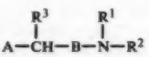
Division of Ser. No. 470,731, Jan. 26, 1990, Pat. No. 5,066,666, which is a division of Ser. No. 55,079, May 28, 1987, Pat. No. 4,914,112. This application Jul. 18, 1991, Ser. No. 732,169

Claims priority, application Japan, Jun. 3, 1986, 128910; Jul. 11, 1986, 164508

Int. Cl.[5] **C07D** *271/07, 263/48;* **A61K** *31/41, 31/42*

U.S. Cl. 514—364 **8 Claims**

1. A compound of the formula:

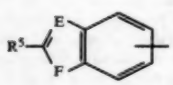


wherein A is the group of the formula:

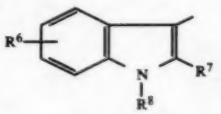
$$Ar^1—D—Ar^2—$$

wherein Ar^1 is phenyl or thienyl which may be optionally substituted with at least one of the same or different halogen; Ar^2 is phenylene or thienylene which may be optionally substituted with at least one of the same or different halogen; D is a divalent radical selected from the group consisting of $>=N—OR^4$ wherein R^4 is hydrogen or lower alkyl, >C=O,

>CHOH, >NH and a single bond, or A is the group of the formula:



wherein R^5 is lower alkoxy or phenyl which may be optionally substituted with at least one of the same or different halogen; E is methine or nitrogen; F is vinylene or oxygen, or A is a group of the formula:



wherein R^6 is lower alkoxy; R^7 is lower alkyl; R^8 is benzoyl which may be optionally substituted with at least one of the same or different halogen, B is a divalent azole group selected from the group consisting of oxazolediyl and oxadiazolediyl; R^1 is hydrogen or lower alkyl; R^2 is hydrogen, lower alkyl, phenyl-lower alkyl, or the group of the formula:

$$R^9—G—$$

wherein R^9 is hydrogen or lower alkyl, halo-lower alkyl, amino-lower alkyl, phenyl or phenyl-lower alkyl or the group of the formula:

wherein R^{10} is hydrogen or lower alkyl; R^{11} is hydrogen, lower alkyl, lower alkenyl, lower cycloalkyl, phenyl-lower alkyl, phenyl or aroyl, or the group of the formula: $—NR^{10}R^{11}$ which is pyrrolidinyl, piperidinyl or hexahydroazepinyl; or the group fo the formula:

$$R^{12}—O$$

wherein R^{12} is lower alkyl or polyhalo-lower alkyl; G is a divalent group selected from the group consisting of >C=O, >=S, $>(C=O)_2$ and $>SO_2$ radical; and the group of the formula: $—NR^1R^2$ which is pyrrolidinyl, piperidinyl or hexahydroazepinyl; R^3 is hydrogen or lower alkyl, or its acid addition salts.

5,180,732

4-TERT.-BUTYL IMIDAZOLE DERIVATIVE AND USE

Hiroki Tomioka, Toyonaka; Noriyasu Sakamoto, Nishinomiya; Kimitoshi Umeda; Hiroaki Fujimoto, both of Toyonaka; Takao Ishiwatari, Minoo, and Hirosi Kisida, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

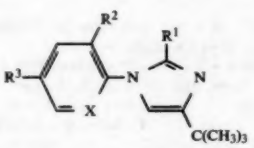
Filed Feb. 20, 1991, Ser. No. 658,322

Claims priority, application Japan, Feb. 20, 1990, 2-40537; Jun. 29, 1990, 2-173135; Sep. 4, 1990, 2-235439

Int. Cl.[5] **C07D** *401/02;* **A61K** *31/44*

U.S. Cl. 514—396 **11 Claims**

1. A 4-tert.-butylimidazole derivative having the formula:



wherein R^1 is a hydrogen atom, a C_1–C_3 alkyl group, a C_1–C_3 alkylthio group or a C_2–C_3 alkoxyalkyl group; R^2 is a halogen atom, a nitro group or a trifluoromethyl group; R^3 is a C_1–C_3 haloalkyl group, a C_1–C_3 haloalkoxy group; X is a nitrogen atom or a group represented by the formula,

in which Y is a halogen atom or a nitro group.

5,180,733

BIOGENIC AMINE UPTAKE INHIBITORS

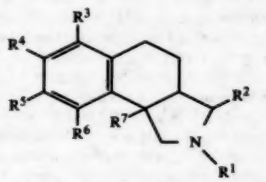
Fatima Z. Basha, Lake Forest; John F. DeBernardis, Lindenhurst, and Robert J. Altenbach, Chicago, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 570,234, Aug. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 502,601, Mar. 30, 1990, abandoned. This application Mar. 22, 1991, Ser. No. 672,011

Int. Cl.[5] A61K *31/40*; C07D *209/56*

U.S. Cl. 514—410 **9 Claims**

1. A compound of the formula:



(I)

wherein

R^1 is hydrogen or C_1–C_6-alkyl;

R^2 is C_7–C_{16}-arylalkyl, wherein the aryl group is unsubstituted or substituted with from one to three non-hydrogen members independently selected from the group consisting of halogen, C_1–C_6-alkyl, halo-C_1–C_6-alkyl, C_1–C_6-alkoxy, hydroxy, amino and C_1–C_6-alkylamino;

R^3, R^4, R^5 and R^6 are independently selected from the group consisting of hydrogen, C_1–C_6-alkoxy, C_1–C_6-alkyl, halogen and halo-C_1–C_6-alkyl, or any two of R^3, R^4, R^5 and R^6 taken together form a methylenedioxy group; and

R^7 is hydrogen, methyl or ethyl;

or a pharmaceutically acceptable salt thereof.

5,180,734

INSECTICIDAL AND ACARICIDAL DIARYLPYRROLECARBONITRILE AND DIARYLNITROPYRROLE COMPOUNDS

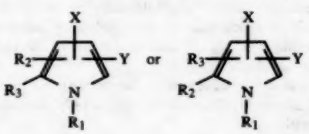
David G. Kuhn, Newtown, Pa.; Joseph A. Furch, Lawrenceville, and Victor M. Kamhi, Hamilton Sq., both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 30, 1990, Ser. No. 621,162

Int. Cl.[5] A01N *43/36*

U.S. Cl. 514—426 **7 Claims**

1. A method for protecting living plants against attack by budworm, comprising, applying to said plants an insecticidally effective amount of a compound having the structure of formula I or II:



(I) (II)

wherein

R_1 is H,

C_1–C_4 alkyl or C_2–C_4 monohaloalkyl, each optionally substituted with from one to three additional halogen atoms, one cyano, one hydroxy, one unsubstituted benzoyl, one or two C_1–C_4 alkoxy groups each optionally substituted with one to three halogen atoms, one C_1–C_4 alkylthio, one C_1–C_4 carbalkoxy, one C_1–C_6 alkylcarbonyloxy, one C_2–C_6 alkenylcarbonyloxy, one benzenecarbonyloxy, or chloro, dichloro,.or methylsubstituted-benzenecarbonyloxy, one phenyl optionally substituted with C_1–C_3 alkoxy or with one to three halogen atoms, one phenoxy optionally substituted with one to three halogen atoms, or one benzyloxy optionally substituted with one halogen substituent;

C_3–C_4 alkenyl optionally substituted with one to three halogen atoms;

cyano;

C_3–C_4 alkynyl optionally substituted with one halogen atom;

di-(C_1–C_4 alkyl)aminocarbonyl; or

C_3–C_6 polymethyleneiminocarbonyl;

R_2 is CN or NO_2;

R_3 is CF_3;

X and Y are each independently phenyl optionally substituted with one or two halogen, CN, NO_2, C_1–C_4 alkyl, C_1–C_4 alkoxy, CF_3 or OCF_2R_4 groups; and

R_4 is H, F, CHF_2, $CHCl_2$ or CF_3.

5,180,735

CYCLOHEXANOL DERIVATIVES, PRODUCTION AND USE THEREOF

Shoji Kishimoto, Takarazuka; Shogo Marui, Suita, and Takeshi Fujita, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

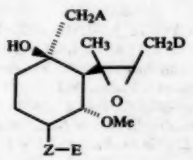
Filed Aug. 29, 1990, Ser. No. 575,559

Claims priority, application Japan, Aug. 31, 1989, 1-226514; Mar. 8, 1990, 2-57752

Int. Cl.[5] A61K *31/38*; C07D *307/80*

U.S. Cl. 514—443 **14 Claims**

1. A compound of the formula:



wherein A is halogen, $-N(O)mR^1R^2$, $-N\oplus R^1R^2R^3X\ominus$, $-S(O)nR^1$ or $S\oplus(O)mR^1R^2X\beta$; and in which R^1, R^2 and R^3 independently are (1) a C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, C_{3-6}cycloalkyl, C_{3-6}cycloalkenyl, C_{7-13}aralkyl or C_{6-10}aryl group, each of which is unsubstituted or substituted by (i) C_{1-6}alkyl, (ii) C_{2-6}alkenyl, (iii) C_{3-6}alkynyl, (iv) C_{3-6}cycloalkyl, (v) C_{3-6}cycloalkenyl, (vi) C_{6-10}aryl, (vii) amino, (viii) C_{1-6}alkylamino, (ix) di-C_{1-6}alkylamino, (x) azido, (xi) nitro, (xii) halogen, (xiii) hydroxyl, (xiv) C_{1-4}alkoxy, (xv) C_{6-10}aryloxy, (xvi) C_{1-6}alkylthio, (xvii) C_{6-10}arylthio, (xviii) cyano, (xix) carbamoyl, (xx) carboxyl, (xxi) C_{1-4}alkoxy-carbonyl, (xxii) C_{7-11}aryloxycarbonyl, (xxiii) carboxy-C_{1-4}alkoxy, (xxiv) C_{1-6}alkanoyl, (xxv) C_{7-11}aroyl, (xxvi) C_{6-10}arylsulfonyl, (xxvii) C_{1-6}alkylsulfinyl, (xxviii) C_{6-10}arylsulfinyl, (xxix) C_{1-6}alkylsufonyl, (xxx) a 5- or 6-membered heterocyclic group containing 1 to 4 hetero atoms of nitrogen, oxygen and/or sulfur, (xxxi) a 5- or 6-membered heterocyclic-carbonyl group containing 1 to 4 hetero atoms of nitrogen, oxygen and/or sulfur, or (xxxii) a 5- or 6-membered heterocyclic-thio group containing 1 to 4 hetero atoms of nitrogen, oxygen and/or sulfur which may be fused with a benzene ring, wherein groups (i) to (xxxii) are unsubstituted or further substituted by one to three groups of any of groups (i) to (xxxii) as defined above, or (2) a 5- or 6-membered heterocyclic group containing 1 to 4 hetero atoms

of nitrogen, oxygen and/or sulfur, which is unsubstituted or substituted by the substituent(s) on the C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, C_{3-6}cycloalkyl, C_{3-6}cycloalkenyl, C_{7-13}aralkyl or C_{6-10}aryl group as defined in (1) of R^1, R^2 and R^3, and which may be fused with benzene, pyridine or cyclohexane; $X\oplus$ is a counter anion; m is an integer of 0 or 1; n is an integer of 0 to 2; R^1 and R^2 together with an adjacent nitrogen atom may form a 4 to 7 membered nitrogen-containing heterocyclic group which is unsubstituted or substituted by the substituent(s) on the C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, C_{3-6}cycloalkyl, C_{3-6}cycloalkenyl, C_{7-13}aralkyl or C_{6-10}aryl groups as defined in (1) of R^1, R^2 and R^3, and which may be fused with benzene, pyridine, pyrazine, pyridazine, cyclohexane or cyclohexene, or R^1 and R^2 together with an adjacent sulfur atom may form a 4 to 7-membered sulfur-containing heterocyclic group which is unsubstituted or substituted by the substituent(s) on the C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, C_{3-6}cycloalkyl, C_{3-6}cycloalkenyl, C_{7-13}aralkyl or C_{6-10}aryl groups as defined in (1) of R^1, R^2 and R^3, and which may be fused with benzene, pyridine, pyrazine, pyridazine, cyclohexane or cyclohexene; Z is $—NR^4$ wherein R^4 is hydrogen, or a C_{1-6}alkyl or C_{6-10}aryl group, each of which is unsubstituted or substituted by the substituent(s) on the C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, C_{3-6}cycloalkyl, C_{3-6}cycloalkenyl, C_{7-13}aralkyl or C_{6-10}aryl groups as defined in (1) of R^1, R^2 and R^3; D is 2-methyl-1-propenyl or isobutyl; E is (i) hydrogen, (ii) a group as defined in (1) of R^1, R^2 and R^3, or (iii) a C_{1-10}alkanoyl, C_{7-11}aroyl, 5- or 6-membered heterocyclic carbonyl containing 1 to 4 hetero atoms of nitrogen, oxygen and/or sulfur, carbamoyl, thiocarbamoyl, C_{6-10}arylsulfonyl, C_{1-6}alkylsulfonyl, sulfamoyl, C_{2-7}alkoxycarbonyl or C_{7-11}aryloxycarbonyl group which is unsubstituted or substituted by the substituent(s) on the C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, C_{3-6}cycloalkyl, C_{3-6}cycloalkenyl, C_{7-13}aralkyl or C_{6-10}aryl groups as defined in (1) of R^1, R^2 and R^3, provided that, when A is chlorine, E is a group of (ii), or a group of (iii) excepting dinitrobenzoyl; or a salt thereof.

5,180,736
POLYCYCLIC AMINES USEFUL AS CEREBROVASCULAR AGENTS

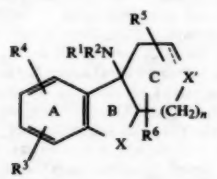
Graham Johnson, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 483,482, Feb. 27, 1990, Pat. No. 5,071,853, which is a continuation-in-part of Ser. No. 327,648, Mar. 23, 1989, abandoned. This application May 17, 1991, Ser. No. 702,660

Int. Cl.[5] A61K *31/35, 31/135;* **C07D** *311/80;* **C07C** *211/42*

U.S. Cl. 514—454 **8 Claims**

1. A compound of formula



I

or a pharmaceutically acceptable salt thereof wherein:

R^1 and R^2 are each independently hydrogen or loweralkyl;

R^3 and R^4 are each hydrogen;

R^5 and R^6 are each independently hydrogen, loweralkyl, loweralkoxy; the—in ring C is an optional double bond,

X' is $—CH_2—$, or —CH—;

n is 1; and

X is $—OCHR^7—$,

wherein R^7 is hydrogen.

5,180,737
PHENYL OR BICYCLO-ALKENYLFLUORO AMIDE PESTICIDES

Robert J. Blade, Berkhamsted, United Kingdom, assignor to Roussel Uclaf, Romainville, France

Filed Jun. 8, 1989, Ser. No. 364,082

Claims priority, application United Kingdom, Jun. 9, 1988, 8813678; Oct. 6, 1988, 8823437

Int. Cl.[5] A01N *37/18;* **C07C** *233/13;* **C07D** *307/10*

U.S. Cl. 514—463 **15 Claims**

1. A compound of the formula (I):

$$Q^1Q(CR^2{=}CR^3)_a(CR^4{=}{:}F)(CR^5{=}CR^6)_bC\text{-}(=O)NHR—^1 \quad \text{(I)}$$

or a salt thereof, wherein Q^1 is a phenyl ring or a fused bicyclic ring system containing 9 of 10 ring carbon atoms, at least one ring being aromatic, or a phenyl ring or fused bicyclic ring system containing 9 or 10 ring carbon atoms substituted with halo, cyano, C_{1-6} alkyl and C_{1-6} alkoxy each optionally substituted by one or more halogen atoms or the substituent is a group $S(O)_mR^9$ wherein m is 0, 1 of 2 and R^9 is C_{1-6} alkyl optionally substituted by halo, or Q^1 is a diahalovinyl group; Q is an alkyl chain containing 1 to 12 carbon atoms and optionally containing one or two oxygen atoms and/or an unsaturated group $—CR^7{=}CR^8—$, or $—{\equiv}C—$, wherein R^7 and R^8 are selected from hydrogen or halo; a is 0 or 1, b is 0 or 1; the sum of a and b is 0 or 1; R^2, R^3, R^4, R^5 and R^6 are the same or different, and are independently selected from hydrogen, halo and C_1–C_4 alkyl; and R^1 is selected from hydrogen and C_{1-6} hydrocarbyl optionally substituted by dioxalanyl, halo, cyano, trifluoromethyl, trifluoromethylthio or C_{1-6} alkoxy.

5,180,738
FUMAGILLOL DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS THEREOF

Shoji Kishimoto, and Takeshi Fujita, both of Takarazuka, both of Japan, assignors to Takeda Chemical Industries, Osaka, Japan

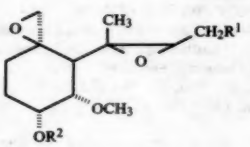
Continuation of Ser. No. 392,028, Aug. 10, 1989, abandoned. This application Jun. 13, 1991, Ser. No. 717,876

Claims priority, application Japan, Sep. 1, 1988, 63-219287; Mar. 6, 1989, 1-53537

Int. Cl.[5] A61K *31/335;* **C07D** *407/10*

U.S. Cl. 514—475 **12 Claims**

7. A pharmaceutical composition comprising a compound of the formula



wherein R^1 is a 2-methyl-1-propenyl or isobutyl group which may be substituted by hydroxyl or di-C_{1-3}-alkylamino, and R^2 is

(1) carbamoyl which may optionally be substituted by

(i) C_{1-6}alkyl which may be substituted by halogen, di-C_{1-3}-alkylamino, nitro, C_{1-6}alkoxycarbonyl or trimethylammonio halide,

(ii) C_{1-6}alkanoyl which may be substituted by di-C_{1-3}alkylamino, nitro, C_{1-6}alkanoyloxy, di-C_{1-6}alkylthio, C_{1-6}alkanoylthio,

(iii) acryloyl or methacryloyl,

(iv) phenyl, naphthyl, benzoyl or benzenesulfonyl which may be substituted by halogen, trifluoromethyl, C_{1-6}alkyl, di-C_{1-3}alkylamino, nitro, C_{1-6}alkanoyloxy or

(v) C_{1-6}alkoxycarbonyl

(vi) phenoxycarbonyl which may be substituted by halogen or C_{1-6}-alkyl,
(vii) amino, or
(viii) carbamoyl which may be substituted by C_{1-6}alkanoyl, halo-C_{1-6}alkanoyl, naphthyl or benzoyl,
(2) benzenesulfonyl which may be substituted by C_{1-6}alkyl or halogen,
(3) C_{1-6}alkylsulfonyl, or
(4) sulfamoyl which may be substituted by C_{1-6}alkyl or phenyl; or a pharmaceutically acceptable salt thereof; and a pharmaceutically acceptable carrier.

5,180,739

USE OF 3-OXYGERMYLPROPIONIC ACID TO TREAT AND PREVENT DIABETES-DEPENDENT TYPE OF AUTOIMMUNE DISEASES

Kiichi Sawai; Masayasu Kurono; Takahiko Mitani; Masanori Nagabuchi, and Keizo Anzai, all of Nagoya, Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Nagoya, Japan

Filed Feb. 23, 1991, Ser. No. 659,649
Claims priority, application Japan, Feb. 28, 1990, 2-48644
Int. Cl.[5] A61K *31/27*
U.S. Cl. 514—491 **4 Claims**

1. A method of treating diabetes in mammals requiring such treatment, comprising administering to said mammal a therapeutically effective amount of 3-oxygermylpropionic acid represented by the formula

$$[(O_{1/8})_3GeCH_2CO_2H]_n$$

wherein n stands for an integer of 1 or more.

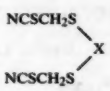
5,180,740

COMPOSITION AND USE OF DIMERCAPTO-SUBSTITUTED DINITRILES AS AN ANTIMICROBIAL

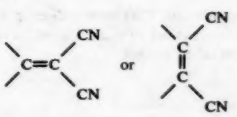
Duane R. Romer, and R. Garth Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 30, 1991, Ser. No. 814,526
Int. Cl.[5] A01N *47/48*; C07C *331/12*
U.S. Cl. 514—516 **11 Claims**

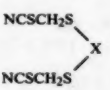
1. A compound corresponding to the formula



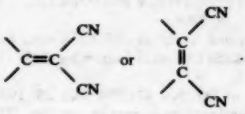
wherein X represents:



8. A method for inhibiting microorganisms in a microbial habitat comprising contacting said microbial habitat with an antimicrobially-effective amount of a compound corresponding to the formula:



wherein X represents:



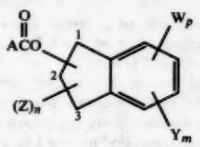
5,180,741

PYRETHRINOID ESTERS CARRYING AN INDANYL NUCLEUS AND THEIR USE AS PESTICIDES

Didier Babin, Montigny; Jean-Pierre Demoute, Auriol, and Jean Tessier, Vincennes, all of France, assignors to Roussel Uclaf, Paris, France

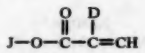
Continuation of Ser. No. 432,732, Oct. 13, 1989, abandoned. This application Jun. 11, 1991, Ser. No. 713,697
Claims priority, application France, Mar. 3, 1988, 89 00087
Int. Cl.[5] A01N *37/08*; C07C *61/06*
U.S. Cl. 514—531 **10 Claims**

1. A compound selected from the group consisting of all possible isomers and mixtures of a compound of the formula

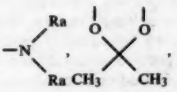


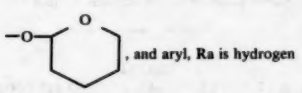
in which

is fixed in position 1, A is



wherein D is selected from the group consisting of hydrogen, halogen and alkoxy of 1 to 8 carbon atoms, J is selected from the group consisting of alkyl of 1 to 8 carbon atoms, alkenyl and alkynyl of 2 to 8 carbon atoms, cycloalkyl of 3 to 8 carbon atoms and carbocyclic aryl of 6 to 14 carbon atoms, all optionally substituted with at least one functional group consisting of halogen, cyano, alkoxy of 1 to 8 carbon atoms, —OH,





, and aryl, Ra is hydrogen

or alkyl of 1 to 8 carbon atoms, Z is in 2- or 3-position and is selected from the group consisting of hydrogen, halogen, alkyl of 1 to 8 carbon atoms, alkenyl and alkynyl of 2 to 8 carbon atoms, cycloalkyl of 3 to 8 carbon atoms, carbocyclic aryl of 6 to 14 carbon atoms, and =O, n is an integer from 1 to 3, Y is in position 4 of the aromatic ring and is $—CH_2—CH=CH_2$, m is 1, W is hydrogen p is 1 or 2.

5,180,742

QUINONE DERIVATIVES, THEIR PRODUCTION AND USE

Shinji Terao, Toyonaka, and Yoshitaka Maki, Kyoto, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

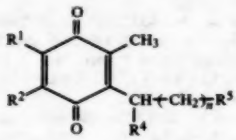
Continuation-in-part of Ser. No. 823,298, Jan. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 760,504, Jul. 30, 1985, abandoned. This application Jan. 9, 1987, Ser. No. 1,893

Claims priority, application Japan, Aug. 1, 1984, 00393; Jan. 8, 1985, 00003

Int. Cl.[5] A01N *37/00*

U.S. Cl. 514—558 **11 Claims**

1. A compound of the formula



wherein

R^1 and R^2 are the same or different, and independently are methyl or methoxy, or R^1 and R^2 together represent —CH=CH—CH=CH—,

R^4 is (a) a phenyl, (b) a naphthyl or (c) thienyl or furyl, each of (a), (b) or (c) being unsubstituted or substituted by 1 to 5 substituents selected from the group consisting of hydroxyl, a halogen, an alkyl having 1 to 3 carbon atoms, an alkoxy having 1 to 3 carbon atoms, acetyl, phenyl, p-tolyl, m-tolyl, a pyridyl, 3-pyridylmethyl, benzoyl, methylenedioxy, trimethylene, 1-imidazolyl and 1-imidazolylmethyl,

R^5 is carboxyl, an alkoxycarbonyl having 2 to 5 carbon atoms, phenoxycarbonyl, and

n is an integer of 2 to 10, or the hydroquinone form of said compound.

5,180,743

ANTI-INFLAMMATORY AND ANALGESIC COMPOUNDS, RELATED COMPOSITIONS AND METHODS FOR PREPARATION AND USE THEREOF

Kazuo Watanabe; Toshio Tuchida, both of Shiga, Japan, and Duane R. Schultz, Miami, Fla., assignors to Xonex Laboratories, Inc., Coral Gables, Fla. and Toyobo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 252,207, Sep. 30, 1988, abandoned. This application May 29, 1990, Ser. No. 530,124

Int. Cl.[5] A61K *31/195*

U.S. Cl. 514—565 **9 Claims**

1. An aqueous composition comprising at least about 1,500 μg/ml of ammonium chloride, at least about 1,200 μg/ml of arginine, at least about 2,500 μg/ml of choline chloride, at least about 700 μg/ml of putrescine and at least about 500 μg/ml of ethanolamine wherein said composition is capable of at least about 85% inactivation of C3 in normal human serum.

5,180,744

ARALKYL-N-TERMINAL AMINO HYDROXY

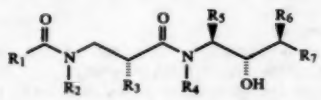
Gunnar J. Hanson, Skokie; John S. Baran, Winnetka; Dave Weissing, Lisle, and Mark Russell, Skokie, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 445,257, Dec. 4, 1989, abandoned. This application Jul. 29, 1991, Ser. No. 736,869

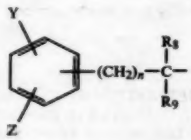
Int. Cl.[5] A61K *31/17*; C07C *233/03, 233/04, 233/07*

U.S. Cl. 514—616 **21 Claims**

1. Compound of the formula



wherein R_1 is selected from aralkyl groups represented by



wherein each of Y and Z is independently selected from hydrido, lower alkyl, hydroxy, halo, alkoxy, carboxy, amino, alkylamino, dialkylamino, aryl, sulfhydryl and thioalkyl; wherein n is a number selected from zero through five, inclusive; wherein each of R_2 and R_4 is independently selected from hydrido and lower alkyl; wherein R_3 is selected from hydrido, alkyl, benzyl, cycloalkyl, cycloalkylalkyl, alkoxyalkyl and alkylthioalkyl; wherein R_5 is selected from cycloalkyl, phenyl, lower alkyl, cycloalkylalkyl and phenylalkyl; wherein R_6 is selected from hydrido, hydroxy, alkoxy, amino, alkylamino, dialkylamino, lower alkyl and cycloalkyl; wherein R_7 is selected from hydrido, alkyl, haloalkyl, cycloalkylalkyl, alkylcycloalkyl, alkylcycloalkenyl and alkoxycarbonyl; wherein R_6 and R_7 may further be taken together to form a carbocyclic ring consisting of from three to about eight ring members; wherein each of R_8 and R_9 is independently selected from hydrido and alkyl; and wherein any of the foregoing R_1 through R_9 substituents having a substitutable position may be substituted with one or more groups selected from alkyl, alkoxy, halo, haloalkyl, alkenyl, alkynyl and cyano; or a pharmaceutically-acceptable salt thereof.

5,180,745

METHOD FOR PROVIDING A NEUROPROTECTIVE EFFECT

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alfort Cedex, France

Filed Jun. 13, 1991, Ser. No. 713,376

Claims priority, application France, Jun. 14, 1990, 90 07442

Int. Cl.[5] A61K *31/165*

U.S. Cl. 514—618 **1 Claim**

1. A method for the treatment of Parkinson's disease which comprises administering to a patient in need thereof a therapeutically effective amount of modafinil.

5,180,746

ARALKYLAMINE COMPOUNDS

Giichi Goto, Toyono; Akinobu Nagaoka, Kawanishi, and Yuji Ishihara, Itami, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

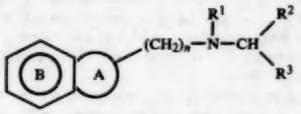
Filed Feb. 15, 1990, Ser. No. 480,564

Claims priority, application Japan, Feb. 17, 1989, 1-038999; Jul. 11, 1989, 1-179438

Int. Cl.[5] A61K *31/125*; C07C *211/27*

U.S. Cl. 514—654 **7 Claims**

1. An aralkylamine compound of the formula



wherein R^1 means a hydrogen atom or a lower alkyl group; R^2 means a phenyl or naphthyl optionally substituted with one or two C_{1-4} alkoxy groups; R^3 means a hydrogen atom; n means an integer of 3, 4 or 5; ring A means a five-membered carbocyclic group optionally substituted by (i) hydroxyl, (ii) oxo or (iii) a phenyl group optionally substituted with one or two C_{1-2} alkoxy groups; and ring B means a benzene ring optionally substituted with one to three substituents selected from the group consisting of halogen, nitro, C_{1-4} alkoxy, and C_{1-4} alkylsulfonyl, or a physiologically acceptable salt thereof.

5,180,747

STABILIZED FAT-SOLUBLE VITAMIN COMPOSITIONS

Yoshihisa Matsuda, Kyoto; Reiko Teroaka, Osaka; Yukio Tanaka, and Hisato Abe, both of Saitama, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 483,533, Feb. 22, 1990, abandoned.
This application May 21, 1992, Ser. No. 887,364
Claims priority, application Japan, Feb. 28, 1989, 1-45358; Feb. 13, 1990, 2-29778
Int. Cl.[5] A61K *31/12, 31/07*
U.S. Cl. 514—681 **8 Claims**

1. A method of providing light stabilization and inhibiting reduction in activity of a fat-soluble vitamin K composition, which comprises:

preparing a fat-soluble vitamin K composition which includes a least 0.01% of vitamin K, by weight, and at least 0.01%, by weight, based on the weight of the vitamin, of a stabilizer selected from the group consisting of a α-carotene, γ-carotene, lycopene and canthaxanthin.

5,180,748

AVARONE AND ITS PHARMACEUTICAL COMPOSITIONS AND USE AS AN ANTIVIRAL AGENT

Werner E. G. Müller, Wiesbaden-Biebrich; Rudolf K. Zahn, Wiesbaden, and Eckart Eich, Mainz, all of Fed. Rep. of Germany, assignors to Merz+Co. GmbH & Co., Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 820,440, Jan. 17, 1986, Pat. No. 4,946,869.
This application Dec. 29, 1989, Ser. No. 458,950
The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.
Int. Cl.[5] A61K *31/12*
U.S. Cl. 514—691 **4 Claims**

1. A method of combating a virus or tumor susceptible thereto comprising administering to a living animal host an effective antiviral or antitumor amount of avarone.

5,180,749

ANTIMICROBIAL COMPOSITION

Timothy M. Cusack, Wallington; Vincent J. Sickora, Roseland, and Robert W. Bender, Jersey City, all of N.J., assignors to Sterling Winthrop, Inc., New York, N.Y.

Filed Aug. 22, 1989, Ser. No. 396,875
Int. Cl.[5] A01N *33/18, 33/24*
U.S. Cl. 514—726 **18 Claims**

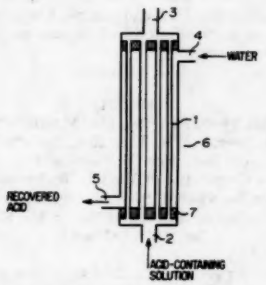
1. An aqueous antimicrobial composition comprising from about 10 to about 30% by weight of ethyl alcohol, from about 2 to about 5% by weight of benzyl alcohol and the remainder to 100% water.

5,180,750

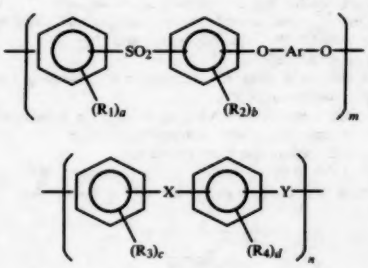
ANION EXCHANGER

Yoshio Sugaya; Ichiro Terada, both of Yokohama; Kiyonari Sanekata, Fujisawa, and Hirofumi Horie, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

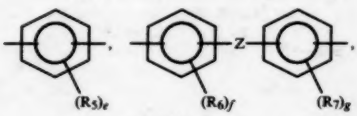
Filed Jul. 26, 1989, Ser. No. 385,229
Claims priority, application Japan, Jul. 29, 1988, 63-188187; Sep. 1, 1988, 63-216329; Sep. 6, 1988, 63-221314
Int. Cl.[5] B01J *41/00*
U.S. Cl. 521—32 **25 Claims**



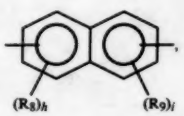
1. An anion exchanger consisting essentially of an aromatic polysulfone block copolymer of the formula:



wherein Ar is

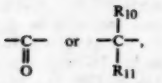


or



X is $—SO_2—$,

—S— or —O— Y is $—SO_2—$, —S— or —O—, Z is a single bond, —O—, —S—, $—SO_2—$,



each of R_1 to R_9 which may be the or different is a hydrocarbon group having from 1 to 8 carbon atoms, each of a to d is an integer of from 0 to 4, e is an integer of from 0 to 3, (f+g) is from 0 to 7, (h+i) is from 0 to 5, each of R_{10} R_{11} is a hydrogen atom or a hydrocarbon group having from 1 to 6 carbon atoms, and each of m and n is an integer of from 2 to 200, provided m/n=100/1-1/10, and said block copolymer having anion exchange groups introduced thereto on the aromatic rings of the copolymer.

5,180,751

POLYPROPYLENE FOAM SHEETS

John J. Park, Neenah, Wis.; Leon Katz, Stamford, Conn., and Norman G. Gaylord, New Providence, N.J., assignors to James River Corporation of Virginia, Richmond, Va.

Division of Ser. No. 493,541, Mar. 14, 1990, Pat. No. 5,116,881. This application May 22, 1992, Ser. No. 886,818

Int. Cl.[5] C08J 9/34

U.S. Cl. 521—51 **10 Claims**

1. A process for producing a foam sheet of a polypropylene characterized by at least

(a) either z - average molecular weight M_z of at least 1.0×10^6 or a ratio of the z - average molecular weight M_z to weight average molecular weight M_w, and

(b) either equilibrium compliance J_{e0} of at least 12×10^{-5} cm^2/dyne or recoverable shear strain per unit stress Sr/S of at least 5×10^{-5} cm^2/dyne at 1 sec^{-1},

comprising the steps of

mixing pelletized polypropylene with a nucleating agent, plasticating the mixture,

introducing a physical blowing agent into the substantially plasticated mixture to form a foaming mixture,

mixing and cooling the foaming mixture,

extruding the foaming mixture into a foamed extrudate, and forming the foamed extrudate into a continuous foam sheet.

5,180,752

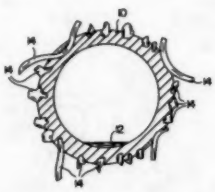
PROCESS FOR MAKING DRY MICROSPHERES

George E. Melber, Buffalo; Leon E. Wolinski, Cheektowaga, both of N.Y., and William A. Oswald, Darien, Ill., assignors to Pierce & Stevens Corporation, Buffalo, N.Y.

Filed Mar. 8, 1990, Ser. No. 490,332

Int. Cl.[5] C08J 9/22

U.S. Cl. 521—57 **7 Claims**



1. The method of making free-flowing dry expanded microspheres with a coating of adherent surface barrier coating, said microspheres being substantially free of agglomerates, comprising the steps of:

A. first mixing and drying an admixture of expandable thermoplastic microsphere wet cake and a surface barrier coating material for a time and at a temperature less than sufficient to expand said microspheres and sufficient to reduce the water content of said admixture to less than about one weight percent, said mixing at shear sufficient to disrupt substantially all microsphere agglomerates in said wet cake, said surface barrier coating material is a free-flowing particulate or fibrous solid having a softening or melting point at a temperature above that of said thermoplastic;

B. thereafter expanding said microspheres by heating the admixture for a time and temperature sufficient to cause expansion thereof and to thermally bond said surface barrier coating to the surfaces thereof; and

C. collecting free-flowing dry microspheres with an adherent coating of said surface barrier coating and substantially free of agglomerates;

wherein said mixing is conducted in a mechanically agitated state at a Reynolds number of at least about 1,000.

5,180,753

PROCESS FOR THE MANUFACTURE OF SYNTHETIC POLYMER PROPELLANT SYSTEMS

Lloyd I. Osipow, 2 Fifth Ave., New York, N.Y. 10011; Dorothea C. Marra, 107 Fernwood Rd., Summit, N.J. 07901, and J. George Spitzer, 44 Coconut Row, Palm Beach, Fla. 33480

Division of Ser. No. 230,680, Aug. 8, 1988, Pat. No. 4,996,240, which is a division of Ser. No. 867,580, May 28, 1986, abandoned. This application Oct. 30, 1990, Ser. No. 605,750

Int. Cl.[5] C08J 9/28

U.S. Cl. 521—65 **2 Claims**

1. A process for the manufacture of a polymer-propellant composition that forms a coherent foamed structure from which an aqueous solution can be expressed consisting of about 5% to about 40% by weight of polymer selected from the group consisting of acrylic and methacrylic acid ester homopolymers and copolymers, from 25% to 60% by weight of an aqueous solution containing from 0 to 60% alcohol, from 20% to 60% by weight of propellant based on the weight of the composition, said process comprising dispersing the polymer in the aqueous solution and dosing said dispersion into a container prior to adding the propellant, adding the propellant to the container and subjecting the resulting composition in the container to a shaking action to bring the dispersed polymer particles into contact with the propellant thereby causing the polymer particles to dissolve quickly in the propellant.

5,180,754

POLYMER COMPOSITION FOR FOAM MOLDING

Yukio Morita; Toshihiro Zushi; Nobuyoshi Matsuda; Kaneharu Suga, all of Itami, and Takuma Takai, Amagasaki, all of Japan, assignors to Mitsubishi Cable Industries, Ltd., Amagasaki, Japan

Filed Jun. 11, 1991, Ser. No. 713,218

Claims priority, application Japan, Jun. 14, 1990, 2-156225; Jun. 14, 1990, 2-156226

Int. Cl.[5] C08J 9/10

U.S. Cl. 521—85 **20 Claims**

1. A foamable electrical insulator composition consisting essentially at least a propylene-ethylene copolymer containing 0.5–20 weight % ethylene component as a base resin, a foaming agent and a low polarity boron compound powder which is not decomposed at a foaming temperature as a nucleator.

5,180,755

METHOD FOR PRODUCING ANTISTATIC POLYURETHANE RESIN

Kuniaki Yasunaga, and Shigeru Ueno, both of Yokohama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 26, 1991, Ser. No. 721,405

Claims priority, application Japan, Jun. 29, 1990, 2-171993

Int. Cl.[5] C08K 3/16

U.S. Cl. 521—116 **5 Claims**

1. A method for producing antistatic flexible polyurethane resins which comprises reacting:

a compound having at least two active hydrogen atoms; and an organic isocyanate;

wherein said reaction takes place in the presence of at least one complex compound of formula

$$[Me(ClO_4)_n]_x[R(OH)_y]_z$$

wherein said complex compound is a liquid at room temperature, and wherein Me is selected from the group consisting of group I and group II elements in the periodic table, n is a number of 1 to 2, x is a number of 1 to 5, y is a number of 1 to 3, z is a number of 1 to 6, and R is a residual group other than hydroxyl group in a polyhydric alcohol or its derivative.

5,180,756

AGENTS CURABLE BY ULTRAVIOLET RADIATION

Gerd Rehmer, Beindersheim, and Andreas Boettcher, Nussloch, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 6, 1990, Ser. No. 505,729

Int. Cl.[5] C08F *2/50*

U.S. Cl. 522—35 **13 Claims**

1. A composition which is curable by ultraviolet radiation and is based on a binder formulation of:

1) from 99.0 to 20% by weight of a copolymer,

2) from 1.0 to 80% by weight of monoolefinically unsaturated compounds, and

3) from 0 to 20% by weight of polyolefinically unsaturated compounds,

wherein the composition contains a copolymer (1) which is obtainable by subjecting to a free-radical-initiated polymerization a mixture of:

(A) from 20 to 99.9% by weight of olefinically unsaturated monomers,

(B) from 0 to 10% by weight of a copolymerizable olefinically unsaturated photoinitiator,

(C) from 0.1 to 10% by weight of a polymerizationregulating initiator selected from the group consisting of 1-(4-isopropylphenyl)-2-hydroxy-2-methylpropane-1-one, isopropyl thioxanthone, 4-isopropylbenzophenone, ethyl2,4,6-trimethylbenzo-ylphenylphosphinate, isopropyl benzoin ether, 2,2-diethoxyacetophenone and ethyl benzoin ether; which initiator reduces the degree of polymerization of the copolymer (1) during the free-radical-initiated polymerization, the sum of (B) and (C) being not less than 0.1% by weight and the stated percentages being based on the sum of the weights of (A)+(B)+(C).

5,180,757

PHOTOPOLYMERIZABLE COMPOSITIONS USED IN ELECTRONICS

Michael Lucey, 11221 S. 51st St., Phoenix, Ariz. 85044

Continuation-in-part of Ser. No. 620,378, Nov. 29, 1990, Pat. No. 5,134,175, which is a continuation-in-part of Ser. No. 133,497, Dec. 16, 1987, abandoned. This application May 16, 1991, Ser. No. 701,664

The portion of the term of this patent subsequent to Jul. 28, 2009, has been disclaimed.

Int. Cl.[5] C08K *3/00*; C08F *2/46*

U.S. Cl. 522—76 **62 Claims**

1. Actinic radiation curable composition suitable for use in coating electronic components and as a printing ink comprising:

(a) only one of either a monomer selected from the group consisting of monofunctional vinyl monomers and multifunctional vinyl monomers or a prepolymer selected from the group consisting of monofunctional vinyl resins and multifunctional vinyl resins;

(b) a photoinitiator;

(c) a filler; and

(d) at least one surface active agent having a molecular weight greater than or equal to about 227;

wherein one of the surface active agent or the filler has a pH greater than or equal to 7 and the other of the surface active agent or the filler has a pH less than or equal to 7 such that dispersion of the filler in the composition is enhanced and relative high loading of filler in the composition is obtainable.

5,180,758

PROCESS FOR PREPARING ANTHRACYCLINONES

Walter Cabri, Milan; Ilaria Candiani, Busto Arsizio; Silvia De Bernardinis, Milan, and Franco Francalanci, Novara, all of Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

PCT No. PCT/EP90/00334, § 371 Date Aug. 26, 1991, § 102(e) Date Aug. 26, 1991, PCT Pub. No. WO90/09974, PCT Pub. Date Sep. 7, 1990

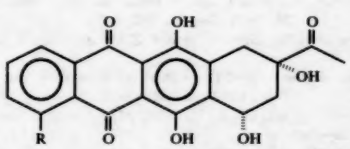
PCT Filed Feb. 28, 1990, Ser. No. 743,373

Claims priority, application United Kingdom, Mar. 2, 1989, 8904794

Int. Cl.[5] C07C *50/22*

U.S. Cl. 552—201 **9 Claims**

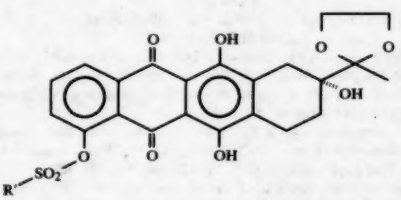
1. A process for the preparation of an anthracyclinone of formula (I):



(I)

wherein R represents a hydrogen atom or a $COOR_1$ group in which R_1 is a hydrogen atom or a straight or branched alkyl group having from 1 to 10 carbon atoms optionally substituted at one or more carbon(s) in the chain by an aryl, alkoxy, ester or amide group, which process comprises:

(i) (a) reacting a 4-demethyl-4-sulfonyl-7-deoxy-13-dioxolanyl daunomycinone of formula (V):



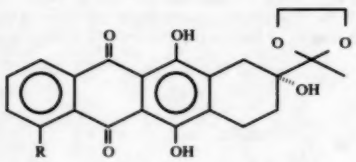
(V)

wherein R′ represents an alkyl group having from 1 to 10 carbon atoms optionally substituted by one or more halogen atoms or an aryl group optionally substituted by halogen, alkyl, alkoxy or nitro, in a reducing environment with a catalytic amount of a compound of formula (VIII):

$$ML_nL'_m \qquad \text{(VIII)}$$

wherein M represents a transition metal atom, L and L′, which may be the same or different, each represent an anion or a neutral molecule selected from the group consisting of Cl, CH_3COO, monophosphine, di-phosphine, phosphite and diamine; and n and m may vary from 0 to 4, such as to obtain a compound of formula (VII):

(VII)



wherein R represents hydrogen; or

(b) carbonylating a 4-demethyl-4-sulfonyl-7-deoxy-13-dioxolanyl daunomycinone of formula (V) as defined above, with carbon monoxide in the presence of a nucleophile R_1OH wherein R_1 is as defined above, an organic or inorganic base and as catalyst a compound of formula (VIII) as defined above, such as to obtain a compound of formula (VII) as shown above wherein R represents a $COOR_1$ group; and

(ii) introducing an α-hydroxy group at the 7-position and removing the 13-oxo protecting group by acid hydrolysis from the resultant compound of formula (VII).

5,180,759

EXOTHERMIC COMPOSITIONS

Max G. Neu, Lichfield, and Michael J. Gough, Gnosall, both of United Kingdom, assignors to Foseco International Limited, Birmingham, England

Division of Ser. No. 35,458, Apr. 7, 1987. This application Apr. 25, 1988, Ser. No. 185,997

Claims priority, application United Kingdom, May 1, 1986, 8610739

The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.[5] C21D *7/00, 3/18*

U.S. Cl. 523—141 **14 Claims**

1. An exothermic composition comprising by weight, 10–30% of a particulate readily oxidizable metal; an oxidizing agent for the metal in an amount of up to 20%; 0.05–10% of an organic fluorine-containing compound selected from the group consisting of polytetrafluoroethylene, polyhexafluoropropylene, polychlorofluoroethylene and polyvinylfluoride; 5–80% of a particulate refractory material; 1–55% of a refractory fiber; and a binder in an amount of up to 25%.

5,180,760

ANTI-FOGGING RESIN FILM-FORMING COMPOSITION

Yoshihiro Oshibe, Aichi; Toshihiro Izumi, Urawa; Hideki Doya, Aichi; Hiroshi Ohmura, Aichi; Yasuhiro Yamamoto, Aichi, and Keiji Kumazawa, Aichi, all of Japan, assignors to Nippon Oil and Fats Company, Limited, Japan

Continuation of Ser. No. 536,053, Jul. 2, 1990, abandoned, which is a continuation of Ser. No. 341,709, Apr. 19, 1989, abandoned. This application Sep. 10, 1991, Ser. No. 758,359

Claims priority, application Japan, Apr. 28, 1988, 63-104233; Dec. 1, 1988, 63-305429; Dec. 26, 1988, 63-330323

Int. Cl.[5] C09K *3/18;* **C08L** *33/26*

U.S. Cl. 523—169 **8 Claims**

1. An anti-fogging curable resin film-forming composition for polycarbonate resin, comprising:

(A) at least one block copolymer or graft copolymer, each copolymer consisting of (1) 50–95 parts by weight of a hydrophilic polymer segment and (2) 50–5 parts by weight of a hydrophobic polymer segment,

(a) said hydrophilic polymer segment being formed of

(i) 1–40% by weight of at least one N-substituted or non-substituted (meth)acrylamide compound represented by the following formulae (I) or (II),

formula (I) being $CH_2{=}CR_1CONR_2R_3$ wherein R_1 and R_2 represent hydrogen atoms or methyl groups; and R_3 represents hydrogen atom, methyl group, ethyl group, n-propyl group, isopropyl group, N,N-dimethylaminopropyl group or $-C(CH_3)_2CH_2COCH_3$, and

formula (II) being

$CH_2{=}CR_1CONA$

wherein R_1 represents hydrogen atom or methyl group; and A represents $-(CH_2)_n-$, wherein n is a positive integer of 4 or 5, or $-(CH_2)_2-O-(CH_2)_2-$;

(ii) 1–20% by weight of at least one monomer having a cross-linkable functional group and being any one of glycidyl (meth)acrylate, N-methylol (meth)acrylate, N-methoxymethylol (meth)acrylamide, and N-butoxymethylol (meth)acrylamide; and

(iii) 40–98% by weight of at least one hydrophilic monomer copolymerizable with (meth)acrylamide compound (i) and monomer having a cross-linkable functional group (ii); and

(b) said hydrophobic polymer segment being formed of

(i) 1–40% by weight of (meth)acrylic acid and

(ii) 60–99% by weight of at least one hydrophobic monomer copolymerizable with (meth)acrylic acid and

(B) 0.1–20 parts by weight of a surfactant per 100 parts by weight of said block or graft copolymer, said surfactant having an affinity for said hydrophilic polymer segment of said block or graft copolymer and capable of being gradually bled out on the surface of said anti-fogging curable resin film from the interior thereof.

5,180,761

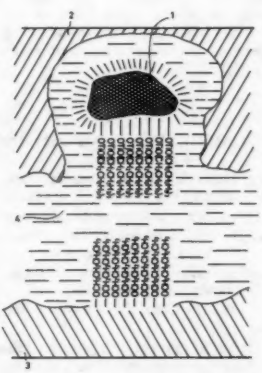
POLYMER BASED SELF-LUBRICATION COMPOSITE

Shin-Jen Shiao, Hsinchu, Taiwan, assignor to National Science Council, Taiwan, Taiwan

Filed May 24, 1991, Ser. No. 705,583

Int. Cl.[5] C08K *9/06*

U.S. Cl. 523—213 **13 Claims**



1. A self-lubricating composite material comprising:

100 parts by weight of polymeric materials;

1–15 parts by weight of liquid lubricants, wherein 0.1–15 parts by weight of said liquid lubricants are polar compounds; and

about 4–100 parts by weight of filler or solid lubricants wherein said fillers or solid lubricants have been treated with 0.2–3 parts by weight of titanates or silane compounds on the basis of 100 parts by weight of fillers or solid lubricants.

5,180,762

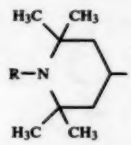
STABILISER COMPOSITION FOR POLYPROPYLENE, COMPRISING TRIAZINE COMPOUNDS CONTAINING PIPERIDINE GROUPS, AND METAL COMPOUNDS

Paola Canova, Casalecchio di Reno, Italy, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 22, 1991, Ser. No. 733,484
Claims priority, application Italy, Jul. 24, 1990, 21036 A90
Int. Cl.[5] C08K 5/34; C07D 401/14, 403/14
U.S. Cl. 524—100 11 Claims

1. A stabiliser composition for polypropylene comprising

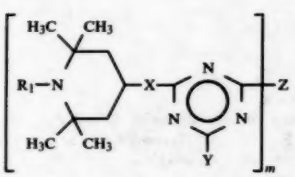
A)between 0.025 and 2% by weight, relative to the weight of the polypropylene, of one or more triazine compounds containing piperidine groups of the formula (I)



(I)

in which R is hydrogen, C_1–C_4alkyl, O•, OH, C_1–C_8alkoxy, C_5–C_8cycloalkoxy, C_3–C_6alkenyl, C_7–C_9phenylalkyl or C_1–C_8acyl, selected from the group consisting of

a) compounds of the formula (II)



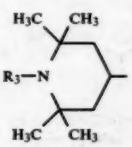
(II)

in which

R_1 is as defined above for R;

X is —O— or >N—R_2 where

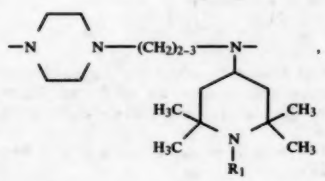
R_2 is hydrogen, C_1–C_{18}alkyl, C_2–C_4alkyl substituted in the 2-, 3- or 4-position by OH, by C_1–C_8alkoxy, by di-(C_1–C_4alkyl)amino or by a 5- to 7-membered nitrogenous heterocyclic group with the free valency on the nitrogen atom, C_5–C_{12}cycloalkyl, C_7–C_9phenylalkyl, tetrahydrofurfuryl or a group of the formula (III)



(III)

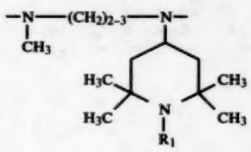
where R_3 is as defined for R;

or X is 1,4-piperazinediyl or a group of the formula (IVa) or (IVb)



(IVa)

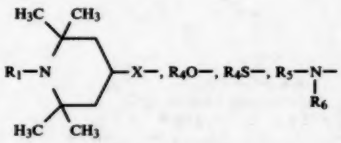
-continued



(IVb)

with R_1 being as defined above and with the nitrogen atom substituted by the piperidyl group being bound to the triazine ring;

Y is one of the groups



in which R_1 and X are as defined above and

R_4, R_5 and R_6 which can be identical or different are as defined for R_2 with the exception of the definition as a group of the formula (III), or they are C_3–C_{18}alkenyl or phenyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl or C_1–C_4alkoxy;

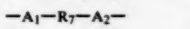
or

is a 5- to 7-membered nitrogenous heterocyclic group;

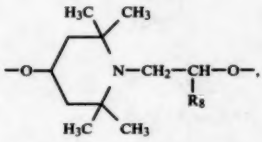
m is an integer from 1 to 6;

and, if m is 1, Z is as defined for Y;

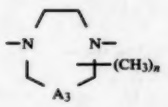
and, if m is 2, Z is one of the groups of the formulae (Va)–(Vc)



(Va)



(Vb)



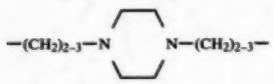
(Vc)

in which

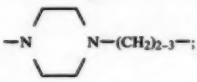
A_1 and A_2 which can be identical or different are —O— or >N—R_9 with R_9 being hydrogen, C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl, C_7–C_9phenylalkyl or a group of the formula (III);

R_7 is C_2–C_{12}alkylene, cyclohexylene, cyclohexylenedimethylene, methylenedicyclohexylene, isopropylidenedicyclohexylene, phenylene, isopropylidenediphenylene, xylylene or C_4–C_{12}alkylene interrupted by 1, 2 or 3 oxygen atoms or by 1 or 2>N—R_{10} groups

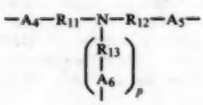
where R_{10} is C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl, C_7–C_9-phenylalkyl or a group of the formula (III);
or, if A_1 and A_2 both are >N—R_9, R_{10} can also be hydrogen, C_1–C_8acyl or (C_1–C_8alkoxy)-carbonyl;
or R_7 or A_1R_7 respectively are a group



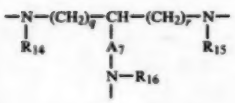
or a group



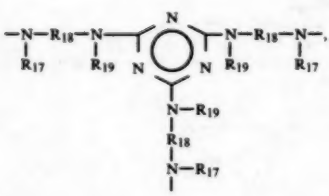
R_8 is C_1–C_8alkyl;
A_3 is a direct bond or CH_2
and n is zero, 1, 2 or 3;
and, if m is 3, Z is one of the groups of the formulae (VIa)–(VIe)



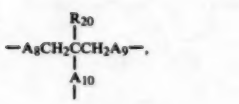
(VIa)



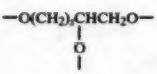
(VIb)



(VIc)

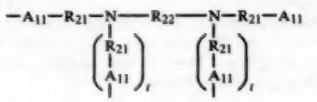


(VId)

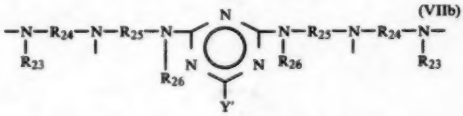


(VIe)

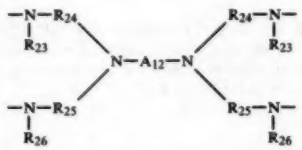
in which
A_4, A_5, A_6, A_8, A_9 and A_{10} which can be identical or different are as defined above for A_1 and A_2;
and, if A_8 and A_9 both are —O—, A_{10} can also be a —CH_2O— group;
R_{11}, R_{12}, R_{13} and R_{18} which can be identical or different are C_2–C_6alkylene;
p is zero or 1;
R_{14}, R_{15}, R_{16}, R_{17} and R_{19} which can be identical or different are as defined above for R_9;
A_7 is a direct bond or —CH_2—
q, r and s which can be identical or different are integers from 2 to 6 and R_{20} is hydrogen or C_1–C_8alkyl;
and, if m is 4, Z is one of the groups of the formulae (VIIa)–(VIId)



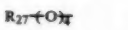
(VIIa)



(VIIb)



(VIIc)

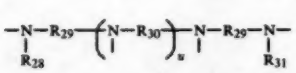


(VIId)

in which
A_{11} is as defined above for A_1 and A_2;
R_{21}, R_{22}, R_{24} and R_{25} which can be identical or different are C_2–C_6alkylene;
t is zero or 1;
R_{23} and R_{26} which can be identical or different are as defined above for R_9;
Y′ is as defined for Y;
A_{12} is 2-hydroxytrimethylene, —CH_2CO—, xylylene, aliphatic or aromatic diacyl having not more than 12 carbon atoms, a group —$COO(CH_2)_4$-$_6OOC$— or a group of the formula (VIII)

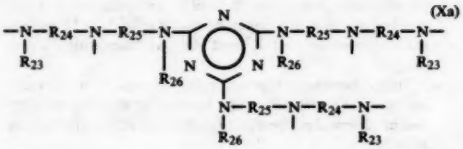
(VIII)

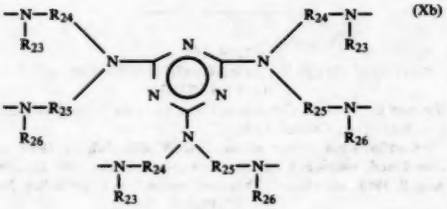
where Y′ is as defined above;
and R_{27} is C_4–C_{12}alkanetetrayl;
and, if m is 5 or 6, Z is a group of the formula (IX)

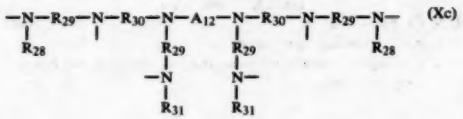


(IX)

in which R_{28} and R_{31} which can be identical or different are as defined above for R_9; R_{29} and R_{30} which can be identical or different are C_2–C_6alkylene and u is 2 or 3;
and, if m is 6, Z is also a group of the formulae (Xa)–(Xc)

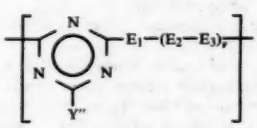

(Xa)


(Xb)


(Xc)

with R_{23}, R_{24}, R_{25}, R_{26}, R_{28}, R_{29}, R_{30}, R_{31} and A_{12} being as defined above;

b) oligomers having a molecular weight between 1,000 and 10,000 and containing recurring units of the formula (XI)


(XI)

in which

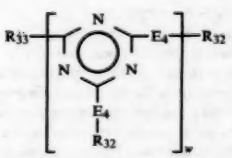
Y″ is as defined above for Y;

E_1 and E_3 which can be identical or different are groups of the formulae (Va)-(Vc);

E_2 is as defined above for A_{12}

and v is zero, 1, 2, 3 or 4, with the proviso that at least one group of the formula (III) must be present in each recurring unit of the formula (XI);

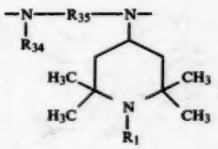
c) oligomers of the formula (XII)

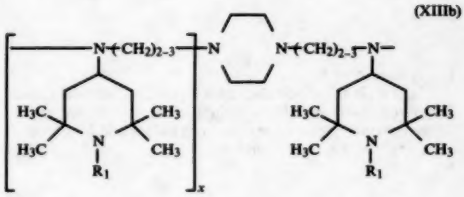

(XII)

in which

R_{32} is hydrogen, C_1–C_8alkyl, C_3–C_6alkenyl, C_7–C_9phenylalkyl, C_1–C_8acyl or (C_1–C_8alkoxy)-carbonyl;

E_4 is a group of the formula (XIIIa) or (XIIIb)


(XIIIa)


(XIIIb)

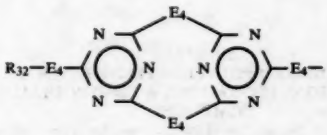
in which

R_{34} is as defined above for R_9

R_{35} is C_2–C_{12}alkylene, cyclohexylene, cyclohexylenedimethylene, methylenedicyclohexylene, xylylene or C_4–C_{12}alkylene interrupted by 1, 2 or 3 oxygen atoms or by a group >N—CH_3;

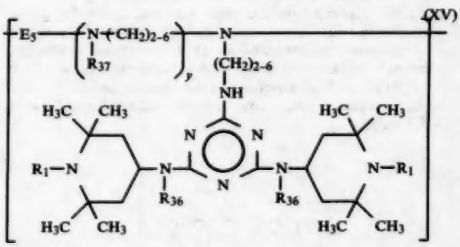
R_1 is as defined above and x is zero or 1;

R_{33} is OH, ONa, OK, C_1–C_8alkoxy, C_3–C_6alkenyloxy, C_7–C_9phenylalkoxy, C_1–C_8acyloxy, a group R_{32}-E_4- or a group of the formula (XIV)


(XIV)

and w is a number from 1 to 20;

d) oligomers having a molecular weight between 1,000 and 10,000 and containing recurring units of the formula (XV)


(XV)

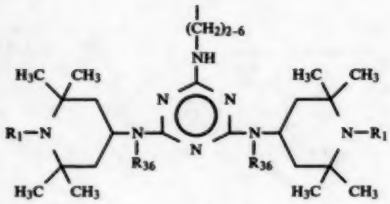
in which

R_1 is as defined above;

R_{36} is as defined above for R_2;

R_{37} is hydrogen, C_1–C_{18}alkyl, a group of the formula (III) or a group of the formula (XVI)

(XVI)



y is zero or 1

and E_5 is as defined above for E_2 or C_2–C_6alkylene, and

B)between 0.005 and 1% by weight, relative to the weight of the polypropylene, of one or more oxides and hydroxides of Mg, Ca, Ba, Zn, Al and Sn.

5,180,763

Patent Not Issued For This Number

5,180,764

STABILIZED POLYPROPYLENE RESIN COMPOSITIONS CONTAINING A DINITRODIAMINE COMPOUND

Hideo Nagasaki, Osaka; Naoki Inui, Yamatokoriyama; Shinichi Yachigo, Toyonaka; Hiroomi Abe; Takeshi Fujii, both of Chiba, and Masashi Yamamoto, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 8, 1991, Ser. No. 681,363

Claims priority, application Japan, Apr. 9, 1990, 2-94486; Apr. 9, 1990, 2-94487

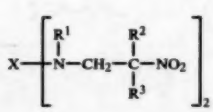
Int. Cl.[5] C08K *5/32*

U.S. Cl. 524—260 **10 Claims**

1. A thermoplastic resin composition comprising

a modified polypropylene resin selected from the group consisting of crystalline polypropylene, crystalline propylene/ethylene random copolymer and crystalline propylene/ethylene block copolymer, each of which is modified with an unsaturated compound; and

a dinitrodiamine compound represented by the following formula:



wherein X is a divalent aliphatic, alicyclic or aromatic group which may contain halogen or oxygen in the group,

R^1 is hydrogen or an aliphatic, alicyclic or aromatic group, provided that two nitrogen atoms linking through X may further link through R^1 when both X and R^1 are the aliphatic groups, and R^2 and R^3 independently of one another are each hydrogen or an alkyl of 1 to 12 carbon atoms, provided that R^2 and R^3 may conjointly form a ring;

said dinitrodiamine compound being present in an effective amount for improviding the thermal processing stability and mechanical properties of said modified polypropylene resin.

5,180,765

BIODEGRADABLE PACKAGING THERMOPLASTICS FROM LACTIDES

Richard G. Sinclair, Columbus, Ohio, assignor to BioPak Technology, Ltd., Golden, Colo.

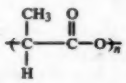
Continuation-in-part of Ser. No. 387,678, Jul. 31, 1989, abandoned, which is a continuation-in-part of Ser. No. 229,896, Aug. 8, 1988, abandoned. This application Sep. 6, 1990, Ser. No. 579,005

Int. Cl.[5] C08K *5/10*

U.S. Cl. 524—306 **110 Claims**

1. A composition comprising:

a. a poly(lactic acid), wherein the poly(lactic acid) has the repeating units,



wherein n is the number of repeating units and n is an integer, $150 \leqq n \leqq 20{,}000$; and

b. a plasticizer selected from the group consisting of lactic acid, lactide, oligomers of lactic acid, oligomers of lactide, and mixtures thereof, wherein:

1. the plasticizer is intimately dispersed within the polymer; and

2. when lactic acid and/or lactide are selected they are present in an amount between about 10 and about 40 weight percent, and when oligomers are selected they are present in an amount between about 10 and about 60 weight percent.

5,180,766

RESIN COMPOSITION FOR PRIMER USE AND PRIMER COMPOSITION EMPLOYING THE SAME

Kazuhide Hayama; Kazuyuki Hata; Katsuhiko Yamada; Keizo Abe, and Takahiro Ozu, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1991, Ser. No. 687,517

Claims priority, application Japan, May 14, 1990, 2-123854

Int. Cl.[5] C08F *255/02;* **C08K** *5/06, 5/07, 5/10*

U.S. Cl. 524—315 **8 Claims**

6. A primer composition comprising

(A) a resin composition containing a copolymer of (I) a radical-polymerizable olefin resin and (c) a monomer copolymerizable with said olefin resin (I) and containing an alkyl (meth)acrylate, a fluorine-containing unsaturated monomer or mixture thereof, said radical-polymerizable olefin resin (I) being a product of the reaction of (a) an olefin resin having at least one functional group per molecule with (b) a radical-polymerizable monomer having a functional group reactive to the functional group contained in said olefin resin (a), and

(B) an organic solvent,

said ingredient (A) being dissolved in said ingredient (B).

5,180,767

FLAME RETARDANT CYCLIC OLEFINIC POLYMER COMPOSITION

Hideki Sakai, and Yohzoh Yamamoto, both of Yamaguchi, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

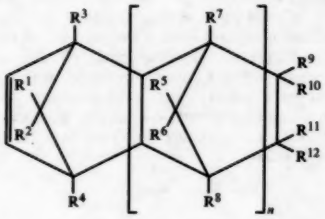
Continuation of Ser. No. 450,465, Dec. 14, 1989, abandoned. This application May 28, 1992, Ser. No. 888,448
Claims priority, application Japan, Dec. 21, 1988, 63-322789
Int. Cl.[5] C08K *3/10*
U.S. Cl. 524—411 12 Claims

1. A flame retardant cyclic olefinic polymer composition which comprises

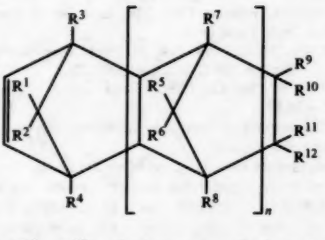
(A) a cyclic olefinic random copolymer formed from an ethylenic component and a cyclic olefinic component represented by the following general formula (I), or

(b) a ring-opened polymer of a cyclic olefinic component represented by the following general formula (I) or a hydrogenated derivative of the polymer which copolymer or polymer has a limiting viscosity (η) of 0.01 to 10 dl/g measured in decalin at 135° C. and a softening temperature (TMA) of 70° C. or more;

(I)



[I]



wherein, R^1 to R^{12} is a hydrogen atom, hydrocarbon group or halogen atom and may be the same or different, or R^9 and R^{10}, or R^{11} and R^{12} may combine to form a divalent hydrocarbon group, or R^9 or R^{10} together with R^{11} or R^{12} may form a ring; and n is O or a positive integer, and when R^5 to R^8 are plurally repeated, n"n"s may be the same or different;

(B) a halogen containing flame retardant,

(C) an antimony containing flame retardant,

(D) polytetrafluoroethylene, and wherein 3 to 50 wt. parts of (B) component, 1 to 30 wt. parts of (C) component and 0.01 to 5 wt. parts of (D) component are compounded per 100 wt. parts of (A) components and

(E) at least one copolymer selected from the group consisting of an amorphous or low crystalline alpha-olefinic copolymer which is formed from at least two alpha-olefins, and an amorphous or low crystalline copolymer which contains as one of monomer constituents styrene or its derivative and has at least one of glass transition temperature of 0° C. or less, and

wherein 5 to 100 wt. parts of (E) component is compounded per 100 wt. parts of (A) component.

5,180,768

COMPOSITION COMPRISING POLYMER OF 4-METHYL-PENTENE-1

Hiromi Sigemoto, Iwakuni, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 512,593, Apr. 24, 1990, abandoned, which is a continuation of Ser. No. 204,120, Jun. 8, 1988, abandoned. This application Feb. 19, 1991, Ser. No. 657,383
Claims priority, application Japan, Jun. 11, 1987, 62-146508
Int. Cl.[5] C08K *3/30*
U.S. Cl. 524—420 8 Claims

1. A composition comprising a polymer of 4-methyl-pentene-1 and a lithopone, the amount of said lithopone being 1 to 70% by weight with respect to the total weight of said polymer and said lithopone.

5,180,769

PROCESS FOR PRODUCING A THERMOPLASTIC ELASTOMER COMPOSITION

Tadashi Hikasa; Koichiro Ibuki; Tatsuo Hamanaka, and Motoo Mizumori, all of Chiba, Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Division of Ser. No. 548,207, Jul. 5, 1990, Pat. No. 5,118,753, which is a continuation of Ser. No. 216,657, Jul. 7, 1988, abandoned. This application Mar. 19, 1992, Ser. No. 854,405
Claims priority, application Japan, Jul. 8, 1987, 62-171911
Int. Cl.[5] C08L *9/00*
U.S. Cl. 524—525 2 Claims

1. A process for producing an olefinic thermoplastic elastomer composition which comprises partially crosslinking a mixture comprising (A) 40–95% by weight of an oil-extended olefinic copolymer rubber obtained by adding 20–150 parts by weight of a mineral oil to a solution of 100 parts by weight of an olefinic copolymer rubber having Mooney viscosity (ML_{1+4} 100° C.) of 170–350 and (B) 5–60% by weight of an olefinic plastic in the presence of an organic peroxide.

5,180,770

BINDING COMPOSITIONS FOR LIGNOCELLULOSIC COMPOSITES AND METHOD FOR THE PREPARATION THEREOF

Agostino Lepori; Ignazio Zavatteri, and Mario Cova, all of Varese, Italy, assignors to Presidenza Del Consiglio Dei Ministri, Rome, Italy

Continuation of Ser. No. 389,886, Aug. 4, 1989, abandoned. This application Sep. 26, 1991, Ser. No. 765,507
Claims priority, application Italy, Aug. 8, 1988, 21682 A/88
Int. Cl.[5] C08L *31/04, 1/00*
U.S. Cl. 524—563 13 Claims

1. An essentially totally water-based polyisocyanic binding composition, useful to give green tack cohesion values greater than 1.0 kg to lignocellulosic materials in the form of granulates, chips, fibers or meal, said binding composition comprising an aqueous emulsion containing at least one polyisocyanate and at least one water-dispersed acetovinylic resin having a glass transition temperature (Tg) less than about 5° C.

5,180,771

ROOM TEMPERATURE CURABLE ORGANOPOLYSILOXANE COMPOSITION

Masatoshi Arai; Yoshifumi Inoue, and Yoshio Inoue, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1990, Ser. No. 508,700
Claims priority, application Japan, Apr. 14, 1989, 1-94960; Aug. 25, 1989, 1-219031
Int. Cl.[5] C08K *5/16*
U.S. Cl. 524—588 5 Claims

1. A room temperature curable organopolysiloxane composition comprising:

(A) 100 parts by weight of a diorganopolysiloxane having a hydroxyl group at both terminal ends of its molecular

chain, or 2 or 3 C_1–C_4 alkoxy groups at each terminal end of its molecular chain;

(B) 1 to 400 parts by weight of a filler;

(C) 0 to 50 parts by weight of an alkoxysilane represented by the general formula (I)

$$(R^1)_mSi(OR^2)_{4-m} \quad (I)$$

where R^1 is a substituted or unsubstituted C_1–C_{20} monovalent hydrocarbon group, R^2 is a C_1–C_4 alkyl group or a C_2–C_4 alkoxyalkyl group, m is an integer of 0 or 1, or a partial hydrolysis product thereof;

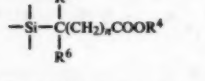
(D) 0.01 to 10 parts by weight of an organosilicon compound having at least one group represented by formula (II):

$$[(R^3)_2N]_2C{=}N- \quad (II)$$

where R^3 is a hydrogen atom or a C_1–C_6 monovalent hydrocarbon group, in its molecule;

(E) 0.01 to 10 parts by weight of an organic tin compound;

(F) 0.1 to 20 parts by weight of an organosilicon compound having at least one group represented by the formula (III)



(III)

where R^4 is a substituted or unsubstituted C_1–C_{20} monovalent hydrocarbon group, or a substituted or unsubstituted phenyl group, R^5 and R^6 are each a hydrogen atom, methyl or ethyl group, and n is an integer of 0, 1 or 2.

5,180,772

NONWOVEN BINDERS OF VINYL ACETATE/ETHYLENE/SELF-CROSSLINKING MONOMER AND TETRAMETHYLOL GLYCOLURIL HAVING IMPROVED SHELF LIFE

Chung-Ling Mao, Emmaus; Joel E. Goldstein, and John G. Iacoviello, both of Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 28, 1989, Ser. No. 317,234

Int. Cl.[5] C08L *31/04*

U.S. Cl. 524—816 **7 Claims**

1. A copolymer-emulsion comprising an aqueous medium having colloidally dispersed therein a copolymer consisting essentially of 60 to 94 wt % vinyl acetate, 5 to 30 wt % ethylene and 1 to 10 wt % of a crosslinkable comonomer and 1 to 45 wt % tetramethylol glycoluril based upon the amount of vinyl acetate in the copolymer.

5,180,773

COPOLYMERIZATE SOLUTIONS BASED ON ADDITION PRODUCTS OF α,β-UNSATURATED CARBOXYLIC ACIDS WITH GLYCIDYL ESTERS AND OF α,β-UNSATURATED MONOMERS WHICH CAN BE COPOLYMERIZED WITH THEM

Horst Dalibor, Norderstedt, Fed. Rep. of Germany, assignor to Synthopol Chemie Dr. rer. pol. Koch GmbH & Co., KG, Buxtehude, Fed. Rep. of Germany

Division of Ser. No. 642,962, Jan. 18, 1991. This application May 5, 1992, Ser. No. 878,520

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1990, 4001579

Int. Cl.[5] C08L *101/08, 37/00*; C08K *5/10*; C08F *4/00*

U.S. Cl. 524—853 **32 Claims**

1. A method of preparing a copolymerizate solution which comprises inert organic solvents and a copolymerizate based on an addition product of an α,β-unsaturated acid with a glycidyl ester and copolymerizable α,β-unsaturated monomers with or without hydroxyl groups, wherein said copolymerizate solution comprises the components:

A) 15–50% by weight of inert organic solvent,

B) 50–85% by weight of a hydroxyl-group-containing copolymerizate wherein said copolymerizate is obtained by means of simultaneous addition esterification and polymerization in an inert organic solvent or mixtures thereof which exhibit a boiling range between 160° C. to 200° C. and by heating under reflux cooling in the presence of a polymerization initiator, of

a) 20 to 30% by weight glycidyl ester of α-alkylalkane monocarboxylic acids and/or α,α-dialkylalkane monocarboxylic acids,

b) 8 to 12% by weight methacrylic acid,

c) 15 to 27% by weight hydroxyalkylmethacrylate with 1 to 6 C atoms in the hydroxyalkyl group,

d) 30 to 53% by weight styrene,

e) 1 to 5% by weight polypropylene glycol monomethacrylate with an average molecular weight of 350 to 387, and

f) 0 to 20% by weight alkylmethacrylate with 1 to 8 C atoms in the alkyl group;

the sum of the components is 100% by weight in each instance; wherein components c) and e) are different, said method comprising heating from 160° to 195° said inert solvent and said glycidyl ester of α-alkylalkane monocarboxylic acids and/or α,α-dialkylalkane monocarboxylic acids; subsequently adding monomers (a), (b), (c), (d), (e) and optionally (f) of component A, and optionally adding a polymerization initiator, a chain-transfer agent and a carboxy-epoxy catalyst, over a period of 12 to 20 hours; and subsequently maintaining the temperature from 160° to 195° for 2 to 5 hours to thereby form the solution of said copolymerizate.

5,180,774

MODIFIED ROSIN ESTERS AND THEIR USE IN PRINTING INKS

Joseph W. LeVine, Panama City, Fla., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 658,208, Feb. 19, 1991. This application Nov. 4, 1991, Ser. No. 787,270

Int. Cl.[5] C08G *63/48*

U.S. Cl. 525—54.44 **3 Claims**

1. A method of making a polymer-modified rosin ester resinate comprising the steps of:

(a) reacting molten rosin selected from the group consisting of tall oil rosin, wood rosin, and gum rosin with a sufficient amount of dienophile selected from the group consisting of fumaric acid, maleic acid, maleic anhydride, acrylic acid, methacrylic acid, citraconic acid, and itaconic acid to form a rosin adduct;

(b) blending the rosin adduct of step (a) with a polymer-modified rosin ester prepared by the steps of esterifying an additional amount of the rosin adduct with a polyfunctional hydroxy compound to form an esterified rosin resin, and reacting said esterified rosin resin with an acrylic containing polymer selected from the group consisting of mixtures of a polymer of acrylic acid, organic ester derivatives of acrylic acid, methacrylic acid, organic ester derivatives of methacrylic acid, mixtures thereof, and a member selected from the group consisting of styrene, alpha methyl styrene, ethylene vinyl acetate, and a combination thereof;

(c) reacting the blend of step (b) with a member selected from the group consisting of reactive zinc, MgO, lime, and mixtures thereof, in the form of a slurry;

(d) heating the reaction product of step (c) at reflux until the resinate is dehydrated; and

(e) adjusting the viscosity of the resinate with hydrocarbon solvent.

5,180,775

BLENDS OF COPOLY(ARYLENE SULFIDE) AND ETHYLENE-PROPYLENE RUBBER

Shriram Bagrodia; David R. Fagerburg; Steven Gedon; Joseph J. Watkins; Paul B. Lawrence, and Mark Rule, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 753,536, Sep. 3, 1991, abandoned. This application Jan. 13, 1992, Ser. No. 819,696

Int. Cl.[5] C08L *81/00*; C08G *62/48*

U.S. Cl. 525—64 **4 Claims**

1. A composition comprising

(A) from 99.9 to 90 weight percent, based on the weight of the composition, of a copoly(arylene sulfide) corresponding to the structure

$$[(-A-S-)_{1-x}(-A-S-S-)_x]_n$$

wherein A is a divalent substituted or unsubstituted aromatic radical, x is in the range of 0.5 to 0.001 and n is at least 25, and

(B) from 0.1 to 10 weight percent, based on the weight of the composition, of a maleated ethylene-propylene rubber having an amount of ethylene in the range of 40 to 90 mole percent and an amount of propylene in the range of 60 to 10 mole percent, based on the total moles of ethylene and propylene.

5,180,776

PRIMER COMPOSITIONS FOR PRETREATMENT OR FITTING OF COATINGS AND PROCESSES FOR TREATING THEM

Minoru Kitayama, Tokyo; Harumi Morifusa, Moriyama, and Katsumi Kondoh, Kusatsu, all of Japan, assignors to Chugoku Marine Paints, Ltd., Hiroshima, Japan

Division of Ser. No. 675,602, Mar. 25, 1991, abandoned, which is a division of Ser. No. 412,701, Sep. 26, 1989, abandoned. This application Nov. 5, 1991, Ser. No. 787,718

Claims priority, application Japan, Nov. 5, 1988, 63-278557

Int. Cl.[5] C08L *31/04*; C08F *265/00*; C08G *63/91*

U.S. Cl. 525—64 **5 Claims**

1. A liquid primer composition for pretreatment or fitting of coatings for polyolefins, natural rubbers and synthetic rubbers comprising:

a first component graft polymer of an unsaturated dicarboxylic acid and an ethylene-vinyl acetate copolymer;

a second component selected from the group consisting of a graft polymer of an unsaturated dicarboxylic acid and an ethylene-ethyl acrylate copolymer and a chlorinated product of a graft polymer of an unsaturated dicarboxylic acid and an ethylene-ethyl acrylate copolymer; and

a third component solvent.

5,180,777

RUBBER-MODIFIED NYLON COMPOSITION

Allen R. Padwa, Worcester; Richard E. Lavengood, Longmeadow, both of Mass., and Raman Patel, Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 237,632, Aug. 26, 1988, abandoned, which is a continuation of Ser. No. 14,885, Feb. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 881,014, Jul. 9, 1985, Pat. No. 4,777,211, which is a continuation-in-part of Ser. No. 767,944, Aug. 21, 1985, abandoned. This application Jul. 19, 1991, Ser. No. 733,017

Int. Cl.[5] C08L *77/00*

U.S. Cl. 525—66 **4 Claims**

1. A polymer blend consisting essentially of:

(A) 5 to 94.5 weight percent of a core/shell graft rubber copolymer comprising from 5 to 80 weight percent of a rubber core of polybutadiene or a butadiene copolymer and from 20 to 95 weight percent of a thermoplastic copolymer shell comprising from 0 to 75 weight percent styrene, 0 to 75 weight percent polar monomer selected from the group consisting of (meth)acrylonitrile and methyl (meth)acrylate, and 1 to 25 weight percent of acrylamide,

(B) 5 to 94.5 weight percent of a polyamide; and

0.5 to 10 weight percent of a terpolymer rubber of an α-olefin, a C_1 to C_4 alkyl acrylate and an acid-containing monomer, having a glass transition temperature below 0° C.

5,180,778

THERMOPLASTIC MOLDING MATERIALS BASED ON POLYPHENYLENE ETHERS AND POLYESTERS

Christof Taubitz, Wachenheim; Erhard Seiler, Ludwigshafen; Klaus Boehlke, Hessheim, and Dietrich Lausberg, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 209,210, Jun. 20, 1988, Pat. No. 4,962,157. This application Aug. 29, 1990, Ser. No. 574,073

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721338

The portion of the term of this patent subsequent to Oct. 9, 2090, has been disclaimed.

Int. Cl.[5] C09L *51/04, 53/02, 71/12*

U.S. Cl. 525—74 **2 Claims**

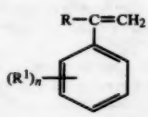
1. A thermoplastic molding material consisting essentially of

A) not less than 5% by weight of a polymer component consisting of from 50 to 100% by weight of polyphenylene ethers and from 0 to 50% by weight of a styrene polymer differing from components C) and D),

B) not less than 5% by weight of one or more polyesters, derived from the aromatic dicarboxylic acids selected from the group consisting of the naphthalene dicarboxylic acids, terephthalic acid and isophthalic acid, which aromatic acids are replaced in an amount of 0–10 mole % by adipic acid, azelic acid, sebacic acid, or the cyclohexane dicarboxylic acids,

C) not less than 0.1% by weight of a copolymer consisting of

C_1) not less than 20% by weight of α-olefins of 2 to 8 carbon atoms, styrene or substituted styrenes of the formula



(I)

where R and R^1 independently of one another are each alkyl of 1 to 8 carbon atoms, hydrogen or halogen and n is 0, 1, 2 or 3, of a mixture of these monomers, and one or more of the components C_2) and C_3), where

C_2) is not less than 0.5% by weight of a polymerizable monomer containing epoxide groups,

C_3) is from 0 to 65% by weight of one or more monomers from the group consisting of acrylonitrile, methacrylonitrile C_1–C_{20} esters of acrylic acid, C_1–C_{20} esters of methacrylic acid, buta-1,3-diene, isoprene, alkylamides of acrylic acid, and alkylamides of methacrylic acid and

D) from 4 to 20% by weight of a rubber impact modifier.

5,180,779

THERMOPLASTIC RESIN COMPOSITIONS RESISTANT TO FLUORINATED/CHLORINATED HYDROCARBONS AND THE USE THEREOF

Ryuji Kamoshita; Hiroki Kashiwagi, and Koji Takimoto, all of Yokkaichi, Japan, assignors to Monsanto Kasei Company, Tokyo, Japan

PCT No. PCT/JP89/01091, § 371 Date Dec. 20, 1990, § 102(e) Date Dec. 20, 1990, PCT Pub. No. WO90/12823, PCT Pub. Date Nov. 1, 1990

PCT Filed Oct. 24, 1989, Ser. No. 623,656

Claims priority, application Japan, Apr. 27, 1989, 1-108746

Int. Cl.[5] C08L *9/02, 9/06*

U.S. Cl. 525—87 **2 Claims**

1. A high nitrile thermoplastic resin composition, characterized by the following conditions (i)–(vii):

(i) the high nitrile thermoplastic resin composition comprises a blend of:

(A) a graft copolymer obtained by polymerizing, in the presence of 20 to 70 parts by weight of a conjugated diene-based synthetic rubber, 30 to 80 parts by weight of a monomer mixture consisting essentially of 50 to 75% by weight of a vinyl cyanide compound and 25 to 50% by weight of an aromatic vinyl compound, with

(B) a vinyl cyanide compound/aromatic vinyl compound copolymer in which the content of the vinyl cyanide compound is in the range of 50 to 75% by weight and the content of the aromatic vinyl compound is thus in the range of 25 to 505 by weight such that the rubber content is in the range of 10 to 20% by weight, the parts by weight and % by weight being respectively the values based on the total amount of these components in question as 100;

(ii) the graft copolymer (A) satisfies the following equation:

$$0.30 \leqq (G-R)/R \leqq 0.50,$$

wherein G means a percentage by weight of a gel in the graft copolymer, calculated in the insoluble matter obtained by dissolution of the graft copolymer in acetonitrile and then separation from the solution by centrifugation, and R means a rubber content of the graft copolymer;

(iii) the graft copolymer (A) has a specific viscosity in the range of 0.04–0.09 determined on a solution of 0.1 g of an acetonitrile-soluble portion of the graft copolymer in 100 ml of dimethylformamide measured by a viscometer;

(iv) the graft copolymer (A) has been produced by emulsion polymerization of predetermined amounts of the monomers in the conjugated diene-based synthetic rubber latex having an average diameter of rubber particles in the range of 0.01–10 μm;

(v) the high nitrile thermoplastic resin composition has a content of the vinyl cyanide compound in the vinyl cyanide compound/aromatic vinyl compound copolymer contained therein in the range of 50–75% by weight;

(vi) the vinyl cyanide compound/aromatic vinyl compound copolymer (B) has a specific viscosity in the range of 0.04–0.09; and

(vii) the high nitrile thermoplastic resin composition has a specific viscosity in the range of 0.04–0.09.

5,180,780

RUBBER-MODIFIED STYRENE-BASED COPOLYMER

Shinichi Nakamura, Sodegaura; Yutaka Tubokura, Ichihara, and Eiichi Terada, Urayasu, all of Japan, assignors to Idemitsu Petrochemical Company Limited, Tokyo, Japan

Continuation of Ser. No. 460,266, Jan. 2, 1990, abandoned. This application Apr. 29, 1992, Ser. No. 877,375

Claims priority, application Japan, Jan. 12, 1989, 1-3737

Int. Cl.[5] C08L *53/02, 33/20, 25/12, 53/00*

U.S. Cl. 525—96 **4 Claims**

1. A rubber-modified styrene-based copolymeric resin comprising a matrix phase consisting of a copolymeric resin of an aromatic monovinyl monomer and a vinyl cyanide monomer and a dispersed phase consisting of particles of a rubbery polymer dispersed in the matrix phase, in which:

(a) the weight ratio of the moiety of the aromatic monovinyl monomer to the moiety of the vinyl cyanide monomer in the copolymeric resin of the matrix phase is in the range from 60:40 to 95:5;

(b) the rubbery polymer is an S-B type block-copolymeric rubber of styrene and butadiene, which rubbery polymer is free of graft copolymers, containing from 25 to 40% by weight of the styrene moiety, of which a 5% by weight solution in styrene has a viscosity in the range from 20 to 60 centipoise at 25° C. and the butadiene segments contain from 5 to 25% moles of 1,2-vinyl linkages, and

(c) the rubbery polymer is dispersed in the matrix of the copolymeric resin of the aromatic monovinyl monomer and the vinyl cyanide monomer in the form of particles having an area-average particle diameter in the range from 0.03 to 0.5 μm in an amount in the range from 3 to 35% by weight based on the rubber-modified styrene-based copolymer, the ratio of the area-average particle diameter to the number-average particle diameter being 2.0 or smaller.

5,180,781

PROCESS FOR THE PRODUCTION OF ALLOYS OF RUBBERS AND AROMATIC POLYESTERS

Holger Lütjens, Cologne; Uwe Westeppe, Mettmann; Karl-Erwin Piejko, Bergisch-Gladbach, and Christian Lindner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 31, 1991, Ser. No. 708,304

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1990, 4018717

Int. Cl.[5] C08L *69/00, 67/03, 33/08;* **C08J** *3/00*

U.S. Cl. 525—148 **5 Claims**

1. A process for the production of an alloy of cross-linked or partially cross-linked rubbers and aromatic polyesters, wherein a mixture of a rubber latex and an aqueous solution of an alkali metal diphenolate or an alkaline earth metal diphenolate is reacted with a solution of a dicarboxylic acid halide and/or a carbonyl halide in a water-immiscible solvent, an aromatic polyester forming at the phase boundary of water/organic solvent, which polyester goes over into the organic phase, and the rubber at the same time going from the aqueous phase into the organic phase, and the organic phase is then separated and the organic solvent is removed.

5,180,782

COMPATIBLE POLYAMIDE-ACRYLIC COMPOSITIONS

Edward Stone, Morris Plains, and Basil Wasyliw, Newark, both of N.J., assignors to BASF Corporation, Parsippany, N.J.

Filed Feb. 19, 1991, Ser. No. 657,039

Int. Cl.[5] C08F *8/30;* **C08L** *31/00*

U.S. Cl. 525—183 **4 Claims**

1. A product of the reaction of a water insoluble polyamide having an amine number greater than 80 mg KOH/g polymer and a melting point less than 110° C., with an aqueous solution of a carboxylic polyelectrolyte wherein the polyelectrolyte is selected from the group consisting of acrylic, methacrylic, maleic and itaconic acid containing polymers, with an acid number of 65–500 mgKOH/g polymer and a weight average molecular weight of 1,500–65,000.

5,180,783

COMPOSITIONS CONTAINING ETHYLENE COPOLYMERS AND RESULTANT PRODUCTS

Brigitte Seguela, Hinges, and Patrick Kaifasz, Lens, both of France, assignors to Atochem, France

Filed Dec. 21, 1990, Ser. No. 633,397

Claims priority, application France, Dec. 27, 1989, 89 172240

Int. Cl.[5] C08L *23/26, 23/36*

U.S. Cl. 525—198 2 Claims

1. The process for the preparation of a composition consisting essentially of at least 60% by weight of at least one copolymer (A) of ethylene and at least one alpha olefin with 3 to 10 carbon atoms and a positive amount up to 40% by weight of a copolymer (B) based on ethylene and at least one anhydride of an unsaturated dicarboxylic acid, said copolymer (A) having a density between 0.850 and 0.890, a residual crystallinity between about 3 and 15%, and a crystalline J melting point between 100° and 125° C., and said copolymer (B) containing at least 80 mol-% of units derived from ethylene and at least 0.1 mol-% of units derived from the anhydride of the unsaturated dicarboxylic acid, comprising:

(a) creating a homogeneous mixture, at a temperature between room temperature and 150° C., of copolymer (B2) and a compound capable of modifying copolymer (B),

(b) adding copolymer (B) to the mixture obtained, at a temperature between room temperature and 150° C., and

(c) adding copolymer (A) to the mixture obtained, at a temperature between about 150° C. and 290° C.;

said copolymer (B2) containing:

(a) from 80–99 mol-% of units derived from ethylene, and

(b) from 1 to 20 mol-% of units derived form at least one ester of a C_1 to C_6 alkyl acrylate to metacrylate.

5,180,784

ADHESIVE RESIN COMPOSITION

Tadayuki Ohmae; Yoshiki Toyoshima; Hisao Tanaka; Mitsuyuki Okada, and Harunori Fujita, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Apr. 16, 1992, Ser. No. 869,179

Claims priority, application Japan, Apr. 19, 1991, 3-088008

Int. Cl.[5] C08L *23/04, 23/16;* C08J *123/04, 123/16*

U.S. Cl. 525—207 4 Claims

1. An adhesive resin composition comprising:

(A) from 2 to 98% by weight of an ethylene copolymer comprising from 50 to 90% by weight of ethylene, from 0 to 49% by weight of an α,β-unsaturated carboxylic acid alkyl ester, and from 0.5 to 10% by weight of maleic anhydride, with the sum of these monomers being 100% by weight;

(B) from 2 to 98% by weight of a crystalline polyethylene resin comprising either an ethylene homopolymer or a copolymer of ethylene and an α-olefin having 3 or more carbon atoms, with an ethylene content being 90% by weight or more; and

(C) from 2 to 50% by weight of a non-crystalline or low crystalline olefin copolymer rubber comprising a copolymer of ethylene and an α-olefin having 3 or more carbon atoms, with the sum of the components (A), (B) and (C) being 100% by weight.

5,180,785

DIAPHRAGM AND METHOD FOR PRODUCING SAME

Masaru Uryu, Chiba; Kunihiko Tokura, Tokyo, and Kyouji Muraoka, Yamaguchi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

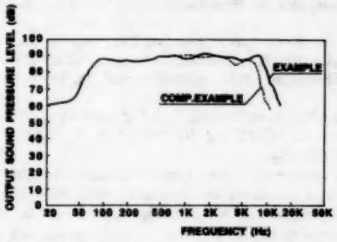
Filed Oct. 23, 1990, Ser. No. 601,391

Claims priority, application Japan, Oct. 23, 1989, 1-275721

Int. Cl.[5] C08L *23/08;* G10K *13/00*

U.S. Cl. 525—240 3 Claims

1. A speaker diaphragm with an improved modulus of elasticity formed essentially of a polyolefin composition produced by a multi-stage polymerization method from an ultra-high molecular weight polyolefin having a limiting viscosity as measured in a Decalin solition of 125° C. of 10 to 40 dl/g and a low to high molecular weight polyolefin having a limiting viscosity as measured in a Decalin solution of 135° C. of 0.1 to



5 dl/g, said ultra-high molecular weight polyolefin having its molecular chain oriented in the radial direction of said diaphragm.

5,180,786

IMPACT MODIFIER, THERMOPLASTIC RESIN COMPOSITION USING THE SAME AND MOLDED ARTICLE OBTAINED THEREFROM

Susumu Era, Ichihara; Toshio Matsumoto, Chiba; Yoshinori Kobayashi, Kisarazu; Masashi Shitara, Sodegauramachi; Isamu Hattori, and Yoshihiro Nomura, both of Ichihara, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Nov. 7, 1989, Ser. No. 432,908

Claims priority, application Japan, Nov. 9, 1988, 63-282827; Nov. 24, 1988, 63-297080; Sep. 29, 1989, 1-256708; Oct. 2, 1989, 1-257378

Int. Cl.[5] C08F *279/02, 265/06, 51/04*

U.S. Cl. 525—281 6 Claims

1. An impact modifier of a graft copolymer (C) obtained by (i) emulsion polymerizing

(a) 99 to 20 parts by weight of a polymerizable monomer mixture comprising

(I) 0.1 to 20% by weight of a polyfunctional monomer,

(II) 50 to 99.9% by weight of an acrylic acid alkyl ester, the alkyl moiety thereof having 1 to 13 carbon atoms, and

(III) 0 to 30% by weight of a copolymerizable vinyl compound other than those mentioned above,

in the presence of

(b) 1 to 80 parts by weight of a conjugated diene rubber,

a total of the components (a) and (b) being 100 parts by weight, to a conversion of 50 to 93% by weight to give a graft rubber polymer (A) containing unreacted polymerizable monomers, and (ii) polymerizing

(B) 40 parts by weight or less and more than 0 part by weight of one or more monomers comprising

(IV) 0 to 100% by weight of an acrylic acid alkyl ester having an alkyl moiety of 1 to 13 carbon atoms,

(V) 0 to 100% by weight of styrene or substituted styrene,

(VI) 0 to 100% by weight of a methacrylic acid alkyl ester, and

(VII) 0 to 40% by weight of a vinyl cyanide compound,

in the presence of 60 parts by weight or more and less than 100 parts by weight of the graft rubber polymer (A), a total of the monomers (B) and the graft rubber polymer (A) being 100 parts by weight.

5,180,787

FLAME RETARDANT POLYMER COMPOSITIONS

Leonard M. Shorr; Theodor M. Fishler, both of Haifa; Shaul Yanay, and Michael Rumack, both of Beer-Sheva, all of Israel, assignors to Bromine Compounds, Ltd., Beer-Sheva, Israel

Continuation-in-part of Ser. No. 251,056, Sep. 26, 1988, abandoned, which is a continuation of Ser. No. 859,784, May 5, 1986, abandoned. This application Nov. 26, 1990, Ser. No. 617,379

Claims priority, application Israel, Jun. 9, 1985, 75459

Int. Cl.[5] C08F *267/10, 265/10, 283/04, 20/00*

U.S. Cl. 525—282 20 Claims

1. Fire retardant polymer compositions comprising non-linear structural configurations consisting essentially of from 2% to 60% by weight of N-tribromophenylmaleimide, or N-tribromophenylmaleimide together with a comonomer selected from the group consisting of an acrylate ester, a methacrylate ester, vinyl acetate, a vinyl halide, a vinylidene halide, acrylonitrile, butadiene, chloroprene, styrene, isobutylene, acrylamide, maleic anhydride and a mixture thereof, directly bonded by means of free-radical initiation to a preformed backbone polymer selected from the group consisting of a polyolefin, a polyamide, a natural rubber, a polyester, an acrylic polymer and a mixture or a copolymer thereof to form a graft polymer containing at least 1.2% by weight bromine in its pendant side chains or crosslinks.

5,180,788

GRAFT-MODIFIED LINEAR LOW-DENSITY POLYETHYLENES, PROCESS FOR THEIR PREPARATION AND THE APPLICATION THEREOF

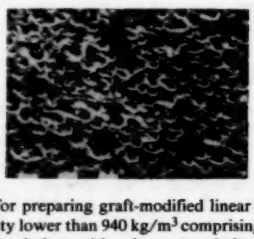
Hubertus J. Vroomans, Beek (L.), Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Division of Ser. No. 418,754, Oct. 5, 1989, Pat. No. 5,021,510, which is a continuation of Ser. No. 177,649, Apr. 5, 1988, abandoned. This application Feb. 7, 1991, Ser. No. 651,987

Claims priority, application European Pat. Off., Apr. 11, 1987, 87200680.4

Int. Cl.[5] C08F *255/04, 255/06*

U.S. Cl. 525—285 6 Claims



1. Process for preparing graft-modified linear polyethylene having a density lower than 940 kg/m^3 comprising the steps of:

reacting polyethylene with at least one ethylenically unsaturated carboxyl-group containing compound and at least one vinylaromatic compound, the molar ratio of the vinylaromatic compound(s) to the carboxyl group containing compound(s) being from 2:1 to 1:2 in the presence of a polar solvent in a weight ratio of 2:1 to 1:10 calculated on the total graft material, at a temperature higher than 110° C. under the influence of shearing forces.

5,180,789

MEDICAL MATERIALS AND PROCESS FOR PREPARING THE SAME

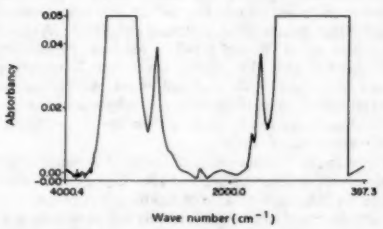
Masatomi Sasaki, Shizuoka, and Nobuyoshi Kashiwagi, Saitama, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1989, Ser. No. 425,200

Claims priority, application Japan, Apr. 9, 1987, 62-85742; Apr. 21, 1987, 62-96339

Int. Cl.[5] C08F *14/18, 8/18;* A61K *31/74;* A61M *5/36*

U.S. Cl. 525—326.3 9 Claims



1. A medical material comprising a reaction product of a copolymer comprising epoxy group-containing hydrophilic polymeric moiety and fluorinated side chain-containing hydrophobic polymeric moiety and a macromolecular cellulosic compound containing a large number of hydroxyl groups, amino groups or carboxyl groups or combination thereof.

5,180,790

WATER SOLUBLE COMPLEXING AGENT FOR METALLIC CATIONS

Jacky Rousset, Baneins, and Georges Ravet, St Genis les Olliéres, both of France, assignors to Coatex S.A., Caluire, France

Continuation of Ser. No. 60,963, Jun. 15, 1987, abandoned, which is a continuation of Ser. No. 898,726, Aug. 14, 1986, abandoned, which is a continuation of Ser. No. 770,356, Aug. 27, 1985, abandoned, which is a continuation of Ser. No. 601,437, Apr. 18, 1984, abandoned. This application May 13, 1991, Ser. No. 701,010

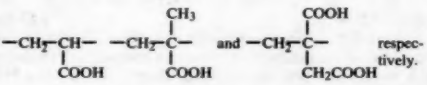
Claims priority, application France, Apr. 20, 1983, 83 06712

Int. Cl.[5] C08F *22/00*

U.S. Cl. 525—329.6 14 Claims

1. A water-soluble complexing agent for metallic cations with a high complexing power and a high threshold effect, comprising:

a terpolymer comprised of from 20 to 60% by weight acrylic acid units, from 20 to 60% by weight methacrylic acid units and from 5 to 40% by weight itaconic acid units, the acrylic acid units methacrylic acid units and itaconic acid units having the formulas:



and respectively.

5,180,791

METHOD OF PRODUCING CHLORINATED POLYOLEFIN

Tadao Kimura, Iwakuni; Toshihide Takahashi, Yamaguchi, and Kazuo Shimizu, Iwakuni, all of Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1990, Ser. No. 623,577
Claims priority, application Japan, Dec. 27, 1989, 1-344658
Int. Cl.[5] C08F 8/22
U.S. Cl. 525—358 10 Claims

1. A method for producing solvent-soluble chlorinated polyolefin as resin for paint, ink, adhesion and film-forming uses comprising suspending polyolefin powder finely pulverized to a specific surface area of 300 to 20,000 cm^2/g into an aqueous medium and chlorinating said polyolefin powder.

5,180,792

AMINE-CURED EPOXY RESIN WITH PHENOXYETHYL (METH) ACRYLATES

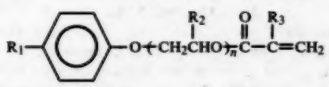
Tetuzi Takada, Kadoma, and Nobuo Gotoh, Matsubara, both of Japan, assignors to Koei Chemical Co., Ltd., Osaka, Japan

Filed Feb. 20, 1991, Ser. No. 657,818
Claims priority, application Japan, Feb. 21, 1990, 2-40318
Int. Cl.[5] C08L 63/02, 63/04
U.S. Cl. 525—423 10 Claims

1. A curable epoxy resin composition comprising;

(a) an epoxy resin having at least two epoxy groups in one molecule,

(b) a monofunctional (meth)acrylate represented by



(I)

wherein R_1 represents a hydrogen atom or an alkyl group having 1 to 12 carbon atoms, R_2 and R_3 respectively represent a hydrogen atom or a methyl group, and n is an integer of 1 to 4, and

(c) An amine curing agent selected from the group consisting of an aromatic polyamine, a modified aromatic polyamine, a polyamideamine and a mixture thereof.

5,180,793

FLAME RESISTANT, LOW PILLING POLYESTER FIBER

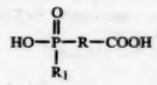
Richard E. Vigneault, Mayo; William S. Wagner, Spartanburg, both of S.C.; Klaus Weisskopf, Wiesbaden, Fed. Rep. of Germany; R. Edward Williamson, Matthews, N.C., and A. John Woodward, Spartanburg, S.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Dec. 31, 1991, Ser. No. 815,204
Int. Cl.[5] C08S 20/20
U.S. Cl. 525—446 28 Claims

1. A flame resistant, low pilling polyester comprising the blended product of the following two polymers:

a) a first polymer the reaction product of a dicarboxylic acid or a lower alkyl ester thereof, a diol and an oxysilicon compound; and

b) a second polymer being the reaction product of a dicarboxylic acid or a lower alkyl ester thereof, a diol and a carboxyphosphinic acid monomer, said monomer being used in an amount of from 0.55 to 20 mole percent based on the total amount of dicarboxylic acid or lower alkyl ester thereof and monomer, said monomer of the general formula



or a lower alkyl ester or cyclic anhydride of said monomer wherein R is a saturated, open-chain or cyclic alkylene, arylene or aralkyl having one to 15 carbon atoms, and R_1 is an alkyl having up to 6 carbon atoms, aryl or aralkyl.

5,180,794

RESIN COMPOSITIONS AND PROCESS FOR FORMING TRANSPARENT THIN FILMS

Sumio Yoda, Takasaki; Nobuyuki Futamura, Maebashi; Matsuo Hashimoto, Tano, and Yoshifumi Saiki, Maebashi, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP89/00441, § 371 Date Jul. 24, 1990, § 102(e) Date Jul. 24, 1990, PCT Pub. No. WO90/12830, PCT Pub. Date Nov. 1, 1990
PCT Filed Apr. 27, 1990, Ser. No. 543,849
Int. Cl.[5] C08L 63/04
U.S. Cl. 525—487 8 Claims

1. A resin composition comprising

(a) a glycidyl ether of a novolak selected from the group consisting of phenol novolak, cresol novolak, and a combination of phenol novolak and cresol novolak;

(b) a novolak selected from the group consisting of phenol novolak cresol novolak, and a combination of phenol novolak and cresol novolak;

(c) an organic solvent;

(d) a silane coupling agent having an aromatic ring and an amino group having active hydrogen in the same molecule.

5,180,795

RETARDERS FOR HARDENING PHENOLIC RESINS

Arthur H. Gerber, Louisville, Ky., assignor to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 562,206, Aug. 2, 1990, Pat. No. 5,096,983. This application May 13, 1991, Ser. No. 698,945
Int. Cl.[5] C08F 283/00; C08G 8/28; B22C 1/00
U.S. Cl. 525—504 17 Claims

1. A binder composition comprising a mixture of:

a. a phenolic resole resin having a pH of about 4.5 to 9, a resin solids content of about 50% to 90% by weight of said resin, and a viscosity of about 100 to 4,000 cps at 25° C.;

b. a magnesium hardening agent selected from the group consisting of magnesium hydroxide and lightburned magnesium oxide the amount of magnesium hardening agent being sufficient to accelerate the hardening of said resin, said lightburned magnesium oxide having a surface area of about 10 to 200 square meters per gram;

c. a retarder selected from the group consisting of: aniline; a substituted aniline having up to one N-alkyl group and up to 2 alkyl groups on the aromatic ring wherein each alkyl group has from 1 to 3 carbon atoms; salicylamide; sulfanilic acid; m-aniline sulfonic acid; and o-aniline sulfonic acid, said retarder being in a quantity sufficient to retard the hardening of the mixture; and

d. from about 5% to 40% by weight of the resin of an ester functional hardening agent selected from the group consisting of a lactone, a carboxylic acid ester, a cyclic organic carbonate, and mixtures thereof.

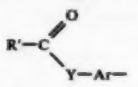
5,180,796

DERIVATIZATION OF ARYLENE SULFIDE POLYMERS

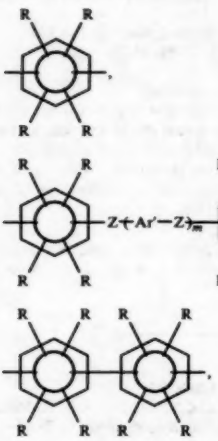
Dirk M. Sutherlin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 26, 1990, Ser. No. 485,008
Int. Cl.[5] C08G 79/04
U.S. Cl. 525—537 13 Claims

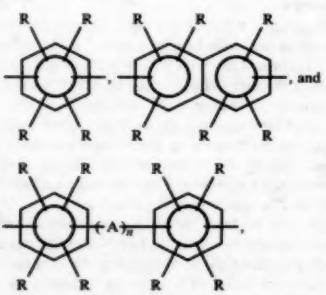
1. A derivatized arylene sulfide polymer composition having end-groups comprising the structure



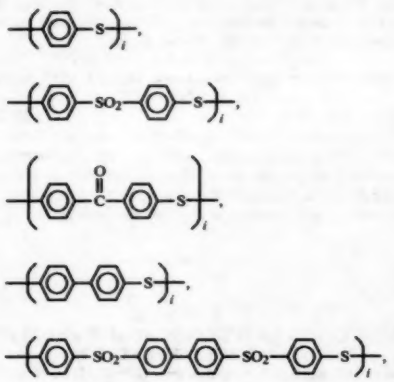
wherein Y is selected from the group consisting of —O—, —NH—, —S—, and —NR'''—, R''' is selected from the group cosisting of an alkyl radical of 1 to about 4 carbon atoms, a cycloalkyl radical of 3 to about 8 carbon atoms and combinations thereof, R' is selected from the group consisting of an alkyl radical having 1 to about 17 carbon atoms, an aryl radical having 6 to about 16 carbon atoms and combinations thereof, and Ar is selected from the group consisting of



and combinations thereof wherein Ar' is a divalent radical selected from the group consisting of



Z is selected from the group consisting of —SO_2— and —CO—, m is 0 or 1, n is 0 or 1, A is selected from the group consisting of oxygen, sulfur, sulfonyl, and CR_2, wherein each R is selected from the group consisting of hydrogen and alkyl radicals having 1 to about 4 carbon atoms, the total number of carbon atoms in all of the R groups in the molecule being 1 to about 12, wherein said arylene sulfide polymer is represented by a formula selected from the group consisting of



and copolymers thereof.

5,180,797

PROCESS FOR CONVERTING POLYKETONES TO POLYESTERS WITH ORGANIC PEROXY ACID

Richard G. Austin, Kingwood, and Tad L. Patton, Baytown, both of Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 27, 1990, Ser. No. 633,351
Int. Cl.[5] C08G 67/02
U.S. Cl. 525—539 12 Claims

1. A process for making a polyester comprising:

contacting a solid or molten polyketone, having a molecular weight greater than 1,000 and containing 0.01 to 50 mole percent carbonyl groups, said carbonyl groups being present in the polymer chain, with an oxidizing agent comprising an organic peroxyacid at a temperature of about 20° C. to about 110° C. to produce a polyester, said organic peroxyacid having from 2 to 30 carbon atoms, the molar ratio of said oxidizing agent to carbonyl in said polyketone being from about 0.1:1 to 30:1 wherein said polyketone and said oxidizing agent are reacted for about five minutes to about 240 minutes.

5,180,798

PROCESS FOR PRODUCTION OF WATER-ABSORBENT RESIN

Morio Nakamura; Takushi Yamamoto, both of Kakogawa; Hitoshi Tanaka, Himeji; Hitoshi Ozawa, Himeji, and Yasuhiro Shimada, Himeji, all of Japan, assignors to Sumitomo Seika Chemicals Co., Ltd., Hyogo, Japan

Filed Jan. 3, 1991, Ser. No. 637,155
Claims priority, application Japan, Jan. 31, 1990, 2-22774
Int. Cl.[5] C08F 2/20
U.S. Cl. 526—66 16 Claims

1. A process for the production of water-absorbent resin by reversed phase suspension polymerization of a water-soluble ethylenic unsaturated monomer, which comprises the steps of:

A. subjecting an aqueous solution of the water-soluble ethylenic unsaturated monomer to a reversed phase suspension polymerization reaction of a first stage in a petroleum hydrocarbon solvent in the presence of a surfactant and/or polymeric protective colloid by using a radical polymerization initiator optionally in the presence of a cross-linking agent,

B. cooling the solution to precipitate the surfactant and/or polymeric protective colloid,

C. adding an aqueous solution of a water soluble-ethylenic unsaturated monomer solution containing a radical polymerization initiator and optionally a crosslinking agent to the first polymerization reaction system to absorb it on gel formed in the first polymerization reaction,

D. then, heating the reaction mixture to carry out a second reversed phase suspension polymerization reaction, and

E. optionally, repeating the above steps B, C, D at least once.

5,180,799

PROCESS FOR POLYMERIZING METHACRYLIC ACID ESTER MONOMERS

Denis G. H. Ballard, Chester; David M. Haddleton, Helsby, and David L. Twose, Tarporley, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Dec. 21, 1990, Ser. No. 631,016

Claims priority, application United Kingdom, Dec. 22, 1989, 8929024

Int. Cl.[5] C08F *4/52*

U.S. Cl. 526—177 **10 Claims**

1. A process for the addition polymerisation of a methacrylic acid ester monomer(s) to yield a polymer having a syndiotacticity of less than 85%, said process being conducted at a temperature in the range of from −20° to 60° C. and comprising contacting the monomer(s), optionally in the presence of a hydrocarbon solvent/vehicle which is inert in the polymerisation process conditions, with a catalyst composition consisting of the product formed on admixing:

(a) a first component of empirical formula:

$$MT \qquad I$$

wherein

M is Li; and

T is a bulky hydrocarbyl group which (1) contains at least 4 carbon atoms, (2) is optionally substituted by one or more pendent substituents and (3) is inert in the polymerisation process conditions; and

(b) a second component of empirical formula:

$$Q(X_m)(Y_n)(Z_p) \qquad II$$

wherein

Q is Al;

m, n and p are each O or an integer such taht (m+n+p)=3; and

X, Y and Z are each independently optionally substituted bulky hydrocarbyl groups, or

X, and Y together are an optionally substituted hydrocarbadiyl group, and Z is an optionally substituted bulky hydrocarbyl group,

all of which groups contain at least 4 carbon atoms and are inert in the polymerisation process conditions.

5,180,800

PROCESS FOR THE PREPARATION OF FINELY DIVIDED, WATER-SWELLABLE POLYSACCHARIDE GRAFT POLYMERS

Klaus Heidel, Marl; Frank Krause, Kleve, and Peter Hofmann, Marl, all of Fed. Rep. of Germany, assignors to Starchem GmbH, Krefeld, Fed. Rep. of Germany

Filed May 3, 1991, Ser. No. 695,223

Claims priority, application Fed. Rep. of Germany, May 8, 1990, 4014628

The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.

Int. Cl.[5] C08F *251/00, 2/32;* C08B *31/00, 15/00*

U.S. Cl. 527—300 **15 Claims**

1. A process for the preparation of finely divided, porous and rapidly water-swellable polysaccharide graft polymers, comprising:

adding an aqueous solution, which contains 60 to 95 parts of a 50 to 100 per cent neutralized olefinically unsaturated carboxylic acid, 0 to 50 parts of other olefinically unsaturated monomers, 0 to 2 parts of crosslinking agent and 0.005 to 5 parts of polymerization initiator, continuously at 40° to 100° C. over a time of 0.5 to 5 hours to a suspension, in nonpolar organic solvent, of 5 to 40 parts of polysaccharide and 0 to 2 parts of polymerization initiator wherein said nonpolar organic solvent contains a dispersing agent mixture consisting of

(a) 50 to 100 per cent by weight of nonionic surfactant having a hydrophilic/lipophilic balance of 0.5 to 10 and

(b) 0 to 50 per cent by weight of nonionic surfactant having a hydrophilic/lipophilic balance of 10.5 to 20 and thereby conducting semi-continuous reverse phase polymerization;

partially dehydrating the polymer product obtained in the polymerization step; and then

cross-linking the partially dehydrated polymer in the presence of 0.005 to 5% by weight of crosslinking agent, based on the polymer.

5,180,801

HEAT CURABLE EPOXY COMPOSITIONS

Jeffrey H. Wengrovius, Scotia, and Virginia M. Van Valkenburgh, East Nassau, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 3, 1991, Ser. No. 754,100

Int. Cl.[5] C08G *77/06, 77/04, 77/00*

U.S. Cl. 528—15 **8 Claims**

1. A heat curable epoxy composition comprising by weight,

(A) 100 parts of an epoxy resin, and

(B) 0.1 to 25 parts of a polysilanesiloxane comprising chemically combined polysilyloxy groups.

5,180,802

MONOAMINE CAPPED NON-REACTIVE POLYAMIDE COMPOSITION

Terrence L. Hartman, New Brunswick, and Charles A. Cody, Robbinsville, both of N.J., assignors to Rheox, Inc., Hightstown, N.J.

Filed Jul. 18, 1990, Ser. No. 553,581

Int. Cl.[5] C08G *69/00*

U.S. Cl. 528—335 **11 Claims**

1. A rheological additive providing viscosity control in resin or organic solvent systems comprising a monoamine capped non-reactive polyamide.

5,180,803

STABILIZATION OF FLUOROPOLYMERS

Howard C. Gibbard, Hertfordshire, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Aug. 1, 1991, Ser. No. 739,056

Claims priority, application United Kingdom, Aug. 3, 1990, 9017156

Int. Cl.[5] C08F *8/00, 6/14*

U.S. Cl. 528—488 **8 Claims**

1. A method for the production of a melt-fabricatable fluoropolymer, by the conversion of a fluoropolymer bearing carboxylic acid groups and prepared as an aqueous dispersion using a dispersion polymerisation process which employs a dispersing agent whose dispersion-stabilising effect is removable by heating the dispersion to a temperature of 190° C. to 240° C. and an initiator which yields carboxylic acid groups on the fluoropolymer, which method comprises, after preparing an aqueous dispersion of the fluoropolymer using dispersion polymerisation, converting the carboxylic acid groups on the fluoropolymer in the aqueous dispersion to carboxylate anion groups using a base and then heating the comodified fluoropolymer dispersion to a temperature of 190° C. to 240° C. to cause simultaneously:

(1) substantial removal of carboxylate anion groups, thereby to yield stable groups in their place, and

(2) isolation of the melt-fabricatable fluoropolymer from the dispersion by coagulation of the fluoropolymer dispersion.

5,180,804

IMPROVING THE WATER ABSORPTION CAPACITY OF CROSSLINKED, WATER-SWELLABLE POLYMERS

Manfred Niessner, Schifferstadt; Juergen Beck, Mannheim; Heinrich Hartmann, Limburgerhof, all of Fed. Rep. of Germany; Andreas H. Kemna, Goleta, Calif., and Stefan Wickel, Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 8, 1990, Ser. No. 564,083

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1989, 3926169

Int. Cl.[5] C08F *6/14*

U.S. Cl. 528—500 5 Claims

1. A process for improving the water absorption capacity of crosslinked, water-swellable polymers, wherein a water-containing, finely divided polymer gel having a solids content of from 20 to 65% by weight is treated with saturated or superheated steam at not less than 50° c., the solids content of the water-containing polymer gel increasing by not more than 10% by weight, and the polymer gel is then dried in a conventional manner.

5,180,805

POLYPEPTIDE COMPETITOR FOR IMMUNOGLOBULIN E

Hannah J. Gould, London, and Birgit A. Helm, Loughton, both of England, assignors to Research Corporation Limited, London, England

PCT No. PCT/GB87/00466, § 371 Date Feb. 24, 1989, § 102(e) Date Feb. 24, 1989, PCT Pub. No. WO88/00204, PCT Pub. Date Jan. 14, 1988

Continuation of Ser. No. 295,033, Feb. 24, 1989, abandoned. This PCT application Jul. 2, 1987, Ser. No. 730,530

Claims priority, application United Kingdom, Jul. 2, 1986, 8616166

Int. Cl.[5] C07K *13/00*

U.S. Cl. 530—324 8 Claims

1. A polypeptide which is capable of binding specifically to the high affinity Ec receptor sites for IgE which exists on human cells and which has the following amino acid sequence:

Gln-Lys-His-Trp-Leu-Ser-Asp-Arg-Thr-Tyr-Thr-Cys-Gln-Val-Thr-Tyr-Gln-Gly-His-Thr-Pha-Glu-Asp-Ser-Thr-Lys-Lys-Cys-Ala-Asp-Ser-Asn-Pro-Arg-Gly-Val-Ser-Ala-Tyr-Leu-Ser-Arg-Pro-Ser-Pro-Phe-Asp-Leu-Phe-Ila-Arg-Lys-Ser-Pro-Thr-Ile-Thr-Cys-Leu-Val-Val-Asp-Leu-Ala-Pro-Ser-Lys-Gly-Thr-Val-Asn-Leu-Thr-Trp-Ser-Arg.

5,180,806

POLYPEPTIDES AND COMPOSITIONS OF HUMAN PAPILLOMAVIRUS LATENT PROTEINS, DIAGNOSTIC SYSTEMS AND METHODS

Joakim Dillner, Stockholm, Sweden; Richard A. Lerner, La Jolla, Calif.; Richard Smith, and D. Elliot Parks, both of Del Mar, Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Continuation-in-part of Ser. No. 194,407, May 16, 1988, abandoned. This application Mar. 13, 1989, Ser. No. 323,614

Int. Cl.[5] A61K *37/02;* C07K *5/00, 7/00, 15/00*

U.S. Cl. 530—326 7 Claims

1. A polypeptide represented by a formula selected from the group consisting of:

MADPAGTNGEEGTGC,

HEDEDKENDGDSLPTC,

RPFKSNKSTCC,

-continued

CCDWCIAAFGLTPSI,

TYDSEWQRDQFLSQVKIPC,

HKSAIVTLTYDSEWQRDQC, and

CINCQKPLCPEEKQRH.

5,180,807

C-TERMINAL PEPTIDE OR PROTEIN SEQUENCING REAGENT AND METHOD

Jerome M. Bailey, Duarte, and John E. Shively, Arcadia, both of Calif., assignors to City of Hope, Duarte, Calif.

Filed Dec. 3, 1991, Ser. No. 801,944

Int. Cl.[5] G01N *33/68;* C07K *1/00, 1/08*

U.S. Cl. 530—345 14 Claims

1. In a process for the carboxy terminal sequencing of a polypeptide which involves the reaction of said protein or peptide with an isothiocyanate reagent to for a carboxy-terminal thiohydantoin amino acid, the improvement which comprises utilizing as said isothiocyanate reagent, a combination of phosphoroisothiocyanatidate and pyridine.

5,180,808

VERSICAN CORE PROTEIN, NUCLEIC ACID SEQUENCES ENCODING THE SAME, NUCLEIC ACID PROBES, ANTI-VERSICAN ANTIBODIES, AND METHODS OF DETECTING THE SAME

Erkki I. Ruoslahti, Rancho Santa Fe, Calif., assignor to La Jolla Cancer Research Foundation, La Jolla, Calif.

Filed Nov. 27, 1989, Ser. No. 441,179

Int. Cl.[5] C07K *3/00;* C07H *15/12*

U.S. Cl. 530—350 7 Claims

1. As a product of recombinant DNA, isolated and purified versican core protein having substantially the amino acid sequence of FIG. 1 and exhibiting binding activity to hyaluronic acid.

5,180,809

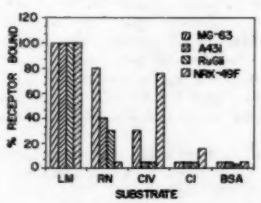
ADHESION RECEPTOR FOR LAMININ AND ITS USE

Erkki I. Ruoslahti; Eva Engvall, both of Rancho Santa Fe, and Kurt R. Gehlsen, San Diego, all of Calif., assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Continuation-in-part of Ser. No. 196,986, May 20, 1988, abandoned. This application May 25, 1989, Ser. No. 357,354

Int. Cl.[5] C07K *15/06, 15/14, 3/20, 17/02*

U.S. Cl. 530—350 8 Claims



1. A substantially pure active mammalian laminin adhesion receptor, characterized by comprising two subunits, one of which is α_3, the α_3 subunit further comprising two disulfide linked polypeptides, said receptor selectively binding with laminin or cell attachment-promoting fragments of laminin.

5,180,810

PROTEIN H CAPABLE OF BINDING TO IGG

Hideyuki Gomi, Osaka; Tatsunobu Hozumi, Toyonaka; Shizuo Hattori, Kobe; Chiaki Tagawa, Takatsuki; Fumitaka Kishimoto, Kawanishi, all of Japan, and Lars Björck, Södra Sandby, Sweden, assignors to Sumitomo Chemical Co., Limited, Osaka, Japan and HighTech Receptor AB, Malmo, Sweden

Filed Jul. 7, 1989, Ser. No. 376,641

Claims priority, application Japan, Nov. 21, 1988, 63-295527; Mar. 9, 1989, 1-58434

Int. Cl.[5] C07K *13/00*

U.S. Cl. 530—350 6 Claims

1. A purified protein produced by group A Streptococcus said protein being localized on the cell surface, having a molecular weight of 45 kilodaltons when measured by SDS-PAGE, and demonstrating specific binding to IgG1, IgG2, IgG3 and IgG4 of humans and to IgG of rabbits, or binding to the Fc portions thereof, and demonstrating a lack of affinity for the other classes of human immunoglobulin and bovine, mouse, rat, sheep, goat IgG.

5,180,811

PROTEINS HAVING A TNF ACTION COMPRISING TNF-FIBROMECTIN FUSION PROTEIN

Thomas Doerper, Bissersheim; Achim Moeller, Limburgerhof; Heinz Hillen, Ludwigshafen; Gerhard Keilhauer, Dannstadt-Schauernheim; Franz Emling, Ludwigshafen, and Lothar Daum, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 13, 1988, Ser. No. 193,661

Claims priority, application Fed. Rep. of Germany, May 16, 1987, 3716513

Int. Cl.[5] C07K *13/00*

U.S. Cl. 530—351 2 Claims

1. A protein having the following amino acid sequence:

Y—Val—X—$(Ser)_n$—ArgThrProSerAspLys

ProValAlaHisValValAlaAsnPro

GlnAlaGluGlyGlnLeuGlnTrpLeuAsnArg

ArgAlaAsnAlaLeuLeuAlaAsnGly

ValGluLeuArgAspAsnGlnLeuValValPro

SerGluGlyLeuTyrLeuIleTyrSer

GlnValLeuPheLysGlyGlnGlyCysProSer

ThrHisValLeuLeuThrHisThrIle

SerArgIleAlaValSerTyrGlnThrLysVal

AsnLeuLeuSerAlaIleLysSerPro

CysGlnArgGluThrProGluGlyAla

GluAlaLysProTrpTyrGluProIleTyrLeu

GlyGlyValPheGlnLeuGluLysGlyAspArg

LeuSerAlaGLuIleAsnArgProAsp

TyrLeuAspPheAlaGluSerGlyGlnValTyr

PheGlyIleIleAlaLeu.

in which n is 0, 1, 2, 3 or 4, X is -Tyr-Ala-Val-Thr-Gly-Arg-Gly-Asp -Ser-Pro-Ala-Ser-Ser-Lys-Pro-Ile-Ser-Ile-Asn-Tyr-Arg-Thr-Glu-Ile-Asp- or part thereof having sufficient length to bind to human fibronectin, and Y is a hydrogen atom or a methionine residue.

5,180,812

SOLUBLE HUMAN INTERLEUKIN-1 RECEPTORS, COMPOSITIONS AND METHOD OF USE

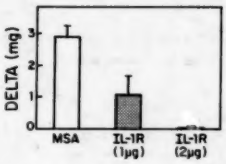
Steven K. Dower, Redmond, Wash.; Carl J. March, Bainbridge Island, Wash.; John E. Sims, Seattle, Wash., and David L. Urdal, Seattle, Wash.

Continuation-in-part of Ser. No. 258,756, Oct. 13, 1988, Pat. No. 5,081,228, which is a continuation-in-part of Ser. No. 160,550, Feb. 25, 1988, Pat. No. 4,968,607, which is a continuation-in-part of Ser. No. 125,627, Nov. 25, 1987, abandoned. This application Dec. 21, 1989, Ser. No. 455,488

The portion of the term of this patent subsequent to Jan. 14, 2009, has been disclaimed.

Int. Cl.[5] C07K *13/00*

U.S. Cl. 530—351 2 Claims



1. A substantially pure and homogeneous soluble human IL-1 receptor (shuIL-1R) protein comprising a sequence of amino acids selected from the group consisting of amino acid sequences 1-318, 1-317, 1-316 and 1-315 of FIG. 1A–1B.

5,180,813

EARLY ENVELOPE GLYCOPROTEIN OF HUMAN CYTOMEGALOVIRUS (HMCV) AND MONOCLONAL ANTIBODIES TO THE GLYCOPROTEINS

Mark F. Stinski, North Liberty, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa

Filed Mar. 24, 1989, Ser. No. 328,227

Int. Cl.[5] C07K *15/28, 15/14*

U.S. Cl. 530—388.3 5 Claims

1. An isolated and purified, immunogenic, early envelope glycoprotein of human cytomegalovirus free of any other human cytomegalovirus proteins, wherein said glycoprotein has a molecular weight of about 48,000 daltons and is encoded by an early structural gene of human cytomegalovirus, which gene maps between about 0.054 and 0.064 map units of the human cytomegalovirus genome and comprises a major open reading frame having an initiation codon located 233 base pairs downstream from the major early transcription start site of the gene.

5,180,814

TUMOR SPECIFIC MONOCLONAL ANTIBODIES

Michael Hanna, Jr., Frederick; Martin V. Haspel, Silver Spring, both of Md., and Herbert C. Hoover, Jr., Port Jefferson, N.Y., assignors to Akzo N.V., Arnhem, Netherlands

Division of Ser. No. 38,811, Apr. 15, 1987, Pat. No. 4,997,762, which is a division of Ser. No. 697,078, Jan. 31, 1985, which is a continuation-in-part of Ser. No. 575,533, Jan. 31, 1984. This application Jan. 22, 1991, Ser. No. 645,069

Int. Cl.[5] C07K *15/28*

U.S. Cl. 530—388.8 1 Claim

1. A human monoclonal antibody having specificity for an epitope in a tumor associated antigen, said antibody produced by a cell line selected from the group consisting of Co 6a3-1 (HB8493), Co 7a4 (HB8494), Co 28A32 (HB9380), Co 16-86 (HB8496), and Co 16-88 (HB8495).

5,180,815

MODIFIED PROTEIN FOR CARRYING HAPTEN

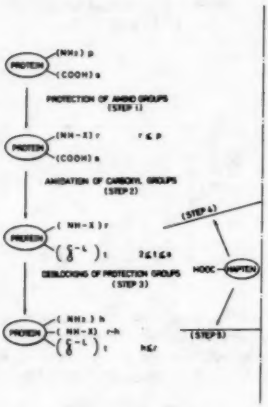
Nobuhito Masuda, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 336,815, Apr. 12, 1989, abandoned. This application May 5, 1992, Ser. No. 880,292

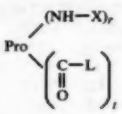
Claims priority, application Japan, Apr. 13, 1988, 63-88971; Sep. 13, 1988, 63-227468; Oct. 20, 1988, 63-262773

Int. Cl.[5] **C07K** *17/02, 15/14;* **C12N** *9/96;* **A61K** *39/385*

U.S. Cl. 530—404 **4 Claims**



1. A modified protein for carrying a hapten represented by the formula:



wherein

Pro is a protein or a polypeptide;

X is a uneliminable or eliminable modifying group for the amino group;

L is a substituted or unsubstituted alkyl group having 1 to 8 carbon atoms and three or more amino groups, one of which combines with the carboxyl group of Pro by an amide linkage;

r is an integer of from 1 to the number of amino groups in the unmodified Pro; and

t is an integer of from 1 to up to the number of carboxyl groups in the unmodified Pro.

5,180,816

ONE VIAL METHOD FOR LABELING PROTEIN/LINKER CONJUGATES WITH TECHNETIUM-99M

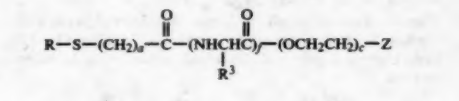
Richard T. Dean, Downingtown, Pa., assignor to Centocor, Malvern, Pa.

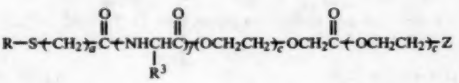
Filed Aug. 24, 1988, Ser. No. 235,908

Int. Cl.[5] **C07K** *3/08;* **A61K** *43/00;* **G01N** *33/53*

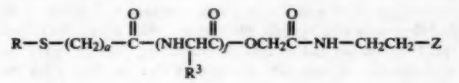
U.S. Cl. 530—404 **46 Claims**

1. A one vial method for labeling a protein with a radioisotope selected from Tc-99m, Re-186, Re-188, Re-189 and Re-191, comprising (a) providing a vial containing a mixture comprising said protein having a sulfhydryl containing bisectional coupling agent bound thereto and a reducing agent; and (b) adding to said vial said radioisotope in an oxidized state, wherein said bisectional coupling agent is selected from compounds of the formula





and



where

a is an integer from 1 to 3 inclusive;

c is an integer from 1 to 7 inclusive;

f is an integer from 3 to 6 inclusive;

R is selected from the group consisting of R_1CO— and R_1S—;

R_1 is selected from the group consisting of optionally substituted lower alkyl and optionally substituted aryl;

R_3 is selected from the group consisting of hydrogen, optionally substituted lower alkyl, and optionally substituted aryl; and

Z is selected from the group consisting of $ClCH_2CONH$—, $BrCH_2CONH$—, ICH_2COHN and N-substituted maleimido.

5,180,817

TRISAZO COMPOUNDS AND USE THEREOF

Kazuya Ogino, Misoo; Kingo Akahori, Toyonaka, and Naoki Harada, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

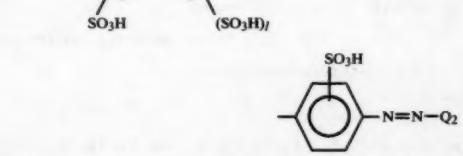
Filed Mar. 18, 1991, Ser. No. 670,581

Claims priority, application Japan, Mar. 28, 1990, 2-081762

Int. Cl.[5] **C07C** *245/10;* **C09B** *31/16*

U.S. Cl. 534—811 **10 Claims**

1. A trisazo compound represented by the following formula (I) in the free acid form:



(I)

wherein Q_1 and Q_2 independently of one another are each unsubstituted or substituted phenyl or naphthyl group and l represents 0 or 1.

5,180,818

SITE SPECIFIC CLEAVAGE OF SINGLE-STRANDED DNA

Thomas R. Cech, and Daniel Herschlag, both of Boulder, Colo., assignors to The University of Colorado Foundation, Inc., Boulder, Colo.

Filed Mar. 21, 1990, Ser. No. 496,852
Int. Cl.[5] C12N *9/00, 15/00*
U.S. Cl. 536—23.1 **8 Claims**

1. A method for specifically cleaving a single-stranded DNA molecule, comprising the steps of:

(a) providing a first RNA molecule selected from the group consisting of a group I intron, a group II intron, or RNAse P, that cleaves a second RNA molecule to leave a 3'-OH, said first RNA molecule having a deoxyribonuclease activity, and

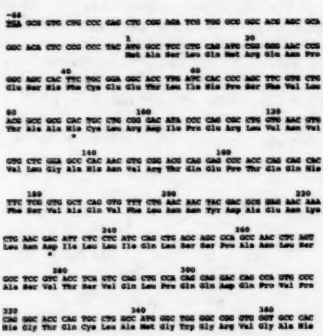
(b) contacting said first RNA molecule with said single-stranded DNA molecule under conditions which allow said first RNA molecule to cause said singlestranded DNA molecule to be cleaved said conditions including providing Mg^{2+} ions and guanosine or guanoisine triphosphate at a pH between 6.0 and 9.5 and a temperature between 20° C and 70° C.

5,180,819

PURIFIED MYELOBLASTIN, NUCLEIC ACID MOLECULE ENCODING SAME, AND USES THEREOF

Yvon Cayre, New York, N.Y., assignor to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Dec. 22, 1989, Ser. No. 455,614
Int. Cl.[5] C07H *15/12*; C07K *3/00*; C12Q *1/68*; A61K *37/00*
U.S. Cl. 536—23.2 **13 Claims**



1. An isolated nucleic acid molecule encoding a myeloblastin and having a coding sequence comprising the coding sequence shown in FIG. 1D.

5,180,820

BRAIN-DERIVED NEUROTROPHIC FACTOR

Yves-Alain Barde, Stiftsbogen 18, Munich 70, Fed. Rep. of Germany D-8000 ; Joachim Leibrock, Hangstrasse 32 A, Gauting, Fed. Rep. of Germany D-8035 ; Friedrich Lottspeich, Drosselweg 1, Neuried, Austria D-8021 ; George Yancopoulos, 100 Haven Ave., Apt. 4A, New York, N.Y. 10032, and Hans Thoenen, Kraepelinstrasse 4A, Munich 2, Fed. Rep. of Germany D-8000

Filed Aug. 30, 1989, Ser. No. 400,591
Int. Cl.[5] C12P *21/06*; C12N *15/00*; A61K *37/24*; C07H *15/12*
U.S. Cl. 536—23.51 **1 Claim**

1. A purified nucleic acid that comprises a sequence that encodes a mature human brain derived neurotrophic factor protein having an amino acid sequence as follows:

His Ser Asp Pro Ala
Arg Arg Gly Glu Leu Ser Val Cys Asp Ser Ile Ser Glu Trp Val Thr Ala Ala Asp Lys Lys Thr Ala Val Asp Met Ser Gly Gly Thr Val Thr Val Leu Glu Lys Val Pro Val Ser Lys Gly Gln Leu Lys Gln Tyr Phe Tyr Glu Thr Lys Cys Asn Pro Met Gly Tyr Thr Lys Glu Gly Cys Arg Gly Ile Asp Lys Arg His Trp Asn Ser Gln Cys Arg Thr Thr Gln Ser Tyr Val Arg Ala Leu Thr Met Asp Ser Lys Lys Arg Ile Gly Trp Arg Phe Ile Arg Ile Asp Thr Ser Cys Val Cys Thr Leu Thr Ile Lys Arg Gly Arg.

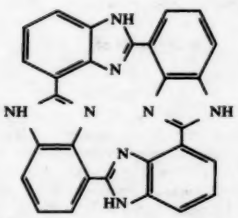
5,180,821

CYCLIC TETRABENZIMIDAZOLE

Arthur S. Obermayer, Newton; James B. Hendrickson, and Sajjat Hussoin, both of Cambridge, all of Mass., assignors to Moleculon Research Company, Newton, Mass.

Continuation of Ser. No. 725,883, Jun. 28, 1991, abandoned, which is a continuation of Ser. No. 464,998, Jan. 16, 1990, abandoned. This application Mar. 9, 1992, Ser. No. 847,835
Int. Cl.[5] C07D *233/54*
U.S. Cl. 540—465 **2 Claims**

1. A yellowish, visually non-fluorescent compound having the formula:



and the tautomers, oxidation, ionization and chelation forms thereof.

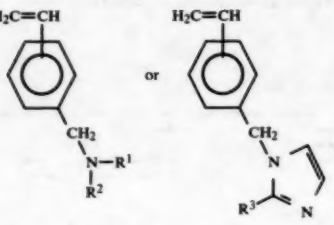
5,180,822

HIGHLY SELECTIVE CHELATING RESINS AND MONOMERS FOR THEIR PREPARATION

Donald W. McQuigg, and Edward E. Sowers, both of Mooresville, Ind., assignors to Reilly Industries, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 609,393, Nov. 5, 1990, Pat. No. 5,147,954, which is a division of Ser. No. 352,980, May 17, 1989, Pat. No. 4,968,806, which is a continuation-in-part of Ser. No. 247,152, Sep. 21, 1988, Pat. No. 5,015,706. This application Aug. 27, 1991, Ser. No. 750,467
Int. Cl.[5] C07D *401/00, 213/36, 211/70*
U.S. Cl. 546—278 **22 Claims**

1. A substantially pure polymerizable monomer for preparing a selective chelating resin, having the general formula:



wherein

R^1 =$(CH_2)_n$ - Py wherein n=1 to 3 and Py=a pyridyl group;

R^2 =H, a C_1 to C_{12} alkyl group optionally a hydroxyalkyl group or, independently, another group of the formula R^1; and

R^3 =a pyridyl group.

5,180,823

PROCESSES FOR PREPARING BICYCLIC COMPOUNDS

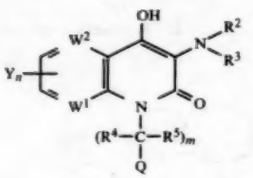
Dinesh Gala, East Brunswick; Martin Steinman, Livingston, and Ashit Ganguly, Upper Montclair, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 435,634, Nov. 13, 1989, Pat. No. 5,079,360, which is a division of Ser. No. 178,176, Apr. 6, 1988, Pat. No. 4,897,487. This application Oct. 8, 1991, Ser. No. 773,184

Int. Cl.[5] C07D *403/04, 401/04, 471/02, 215/16*

U.S. Cl. 544—212 **5 Claims**

1. A process for preparing a compound of the Formula



(VII)

wherein

W^1 and W^2 independently represent —CH═or —N═;

R^2, R^3, R^4 and R^5 independently represent H, alkyl having from 1 to 12 carbon atoms, alkenyl having from 3 to 8 carbon atoms, alkynyl having from 3 to 8 carbon atoms, alkoxyalkyl having from 1 to 6 carbon atoms in the alkoxy portion and from 2 to 6 atoms in the alkyl portion thereof, hydroxyalkyl having from 2 to 8 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms, acyloxyalkyl having from 1 to 6 carbon atoms in the acyloxy portion and from 2 to 8 carbon atoms in the alkyl portion thereof, and —R^6—CO_2R^0 wherein R^6 represents an alkylene group having from 1 to 6 carbon atoms and R^0 represents hydrogen or an alkyl group having from 1 to 6 carbon atoms, with the provisos that the OH of the hydroxyalkyl group and the acyloxy of the acyloxyalkyl group are not joined to the same carbon atom as another heteroatom and that, when R^2 and/or R^3 are alkenyl or alkynyl, there is at least one carbon-carbon single bond between the nitrogen atom and the carbon-carbon double or triple bond and also with the proviso that R^3 does not independently represent hydrogen;

in addition, one of R^2 or R^3 can be an aryl group or an aromatic heterocyclic group, either of which can be substituted with one to three substituents Y as defined below;

in further addition, R^2 and R^3 can be joined together to represent a ring which can contain from 2 to 8 carbon atoms, said ring optionally containing a —O—, —S— and/or —NR^4— heteroatomic group (wherein R^4 is as defined above) and/or optionally containing a carbon-carbon double bond, and said ring optionally being substituted with one to three additional substituents R^7 which substituents may be the same or different and are each independently selected from OH with the proviso that OH is not on a carbon already joined to a hetero atom, —O—acyl having from 1 to 6 carbon atoms, hydroxyalkyl having from 1 to 8 carbon atoms, alkoxyalkyl having from 1 to 6 carbon atoms is each alkyl portion thereof, alkyl having from 1 to 6 carbon atoms, alkenyl having from 3 to 8 carbon atoms, alkynyl having from 3 to 8 carbon atoms, —$COOR^{10}$ wherein R^{10} is H, alkyl or aryl, or any two R^7 substituent groups may represent a hydrocarbon ring having from 4 to 8 total carbon atoms;

in still further addition, both R^2 and R^3 can be joined together to represent a polycyclic ring, which polycyclic ring can optionally be substituted by one to three substituents groups R^7 is defined above;

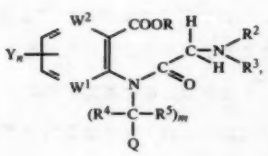
m is an integer of from 0 to 3;

n is an integer of from 0 to 2;

Q represents an aryl or an aromatic heterocyclic group which can optionally be substituted with 1 to 3 substituents Y as defined below;

each Y substituent is independently selected from the group consisting of hydroxy, alkyl having from 1 to 6 carbon atoms, halogen, NO_2, alkoxy having from 1 to 6 carbon atoms, trifluoromethyl, cyano, cycloalkyl having from 3 to 7 carbon atoms, alkenyloxy having from 3 to 6 carbon atoms, alkynyloxy having from 3 to 6 carbon atoms, hydroxyalkyl having from 1 to 6 carbon atoms, —S(O)$_n$—R^8 (wherein R^8 represents alkyl having from 1 to 6 carbon atoms and n is as defined above), —SO_2NH_2, —CO—R^9 (wherein R^9 represents OH, —NH—R^8 or —O—R^8, where R^8 is as defined above), —O—B—COR^9 (wherein B represents an alkylene group having from 1 to 4 carbon atoms and R^9 is as defined above), —NH_2, —NHCHO, —NH—CO—R^9 (wherein R^9 is as defined above, with the proviso that it is not hydroxy), —NH—$COCF_3$, —NH—SO_2R^8 (wherein R^8 is as defined above), and —$NHSO_2CF_3$,

comprising contacting an amino acetamide compound of the formula:



(V)

wherein

Y, W^1, W^2, R^2, R^3, R^4, R^5, Q, m and n are as defined hereinbefore, and

R is any of the values for R^4 or R^5 with the proviso that R is not hydrogen,

with a base effective to selectively remove a proton from the methyl group of said amino acetamide compound (V) in order to intramolecularly cyclize said compound to the bicyclic compound of formula (VII).

5,180,824

6-AZIDO-2-FLUOROPURINE, USEFUL IN THE SYNTHESIS OF NUCLEOSIDES

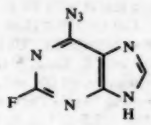
John G. Bauman, Alameda, and Randolph C. Wirsching, Livermore, both of Calif., assignors to Berlex Biosciences Inc., Alameda, Calif.

Filed Nov. 29, 1990, Ser. No. 620,236

Int. Cl.[5] C07D *473/40;* **C07H** *19/20*

U.S. Cl. 544—251 **16 Claims**

1. A compound 6-azido-2-fluoropurine, with the structure:



3. A method for preparing 2-fluoradenine comprising the following steps:

(a) reacting 2-amino-6-chloropurine with an alkali metal azide to yield 2-amino-6-azidopurine;

(b) diazotizing and fluorinating 2-amino-6-azidopurine to yield 6-azido-2-fluoropurine; and

(c) reducing 6-azido-2-fluoropurine to yield 2-fluoroadenine.

5,180,825

MITOMYCIN DERIVATIVES

Hitoshi Arai; Motomichi Kono, both of Shizuoka; Masaji Kasai, Fujisawa; Katsushige Gomi, Susono, and Tadashi Ashizawa, Numazu, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

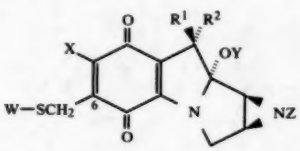
Filed Nov. 13, 1991, Ser. No. 791,188

Claims priority, application Japan, Nov. 13, 1990, 2-306663

Int. Cl.[5] C07D *239/02, 401/00, 417/00, 403/00, 487/00, 487/14*

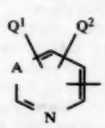
U.S. Cl. 544—318 **19 Claims**

1. A mitomycin derivative represented by the Formula (I):



(I)

where W represents a member selected from the group consisting of (a), (b), (c), (d) and (e):

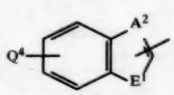


(a)

wherein A is —N= or —CR^3= wherein R^3 is selected from hydrogen, hydroxy, amino, phenyl and C1–6 alkyl, each of Q^1 and Q^2 are independently selected from hydrogen, hydroxy, amino, phenyl and C1–6 alkyl,

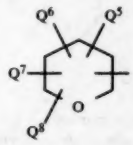
(b)

wherein A^1 has the same meaning as A, Q^3 has the same meaning as Q^1, B and D are each independently selected from —N= and —CR^4= wherein R^4 has the same meaning as R^3 with the proviso that when A^1, B and D are all —N=, then E is NR^5, E is selected from S, O and NR^5 wherein R^5 has the same meaning as R^3,



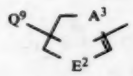
(c)

wherein A^2 has the same meaning as A, E^1 has the same meaning as E and Q^4 has the same meaning as Q^1,



(d)

wherein Q^5, Q^6, Q^7 and Q^8 are each independently selected from hydrogen, hydroxy, C1–6 alkanoyloxy, hydroxymethyl and C1–6 alkanoyloxymethyl, and



(e)

wherein A^3 has the same meaning as A, E^2 has the same meaning as E, Q^9 has the same meaning as Q^1, X is selected from methoxy and amino, Y is selected from hydrogen and methyl, Z is selected from hydrogen, methyl and C1–6 alkanoyl, and one of R^1 and R^2 represents carbamoyloxymethyl, and the other represents hydrogen or R^1 and R^2 are combined to form methylene.

5,180,826

PROCESS FOR THE PRODUCTION OF 1-(N-METHANESULFONYL-N-METHYLAMINOSULFONYL)-3-(2-PYRIMIDYL) UREA DERIVATIVES

Gareth Griffiths, Visp; Aleksander Warm, Visperterminen; Felix Previdoli, Brig, and Gary Ryan, Visp, all of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

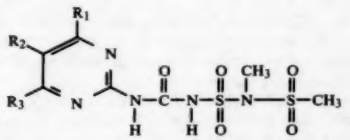
Filed Mar. 19, 1992, Ser. No. 854,536

Claims priority, application Switzerland, Mar. 21, 1991, 871/91

Int. Cl.[5] C07D *239/42*

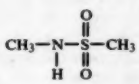
U.S. Cl. 544—332 **8 Claims**

1. A process for the production of 1-(N-methanesulfonyl-N-methylaminosulfonyl)-3-(2-pyrimidyl) urea derivatives of the formula:



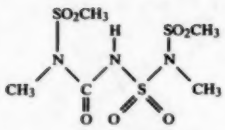
I

wherein R_1, R_2 and R_3 are the same or different and each is a hydrogen atom, a C_1–C_4 alkoxy group, a hydroxyl group or a halogen atom, comprising: in a first stage, converting methanesulfonylethyl amine of the formula:



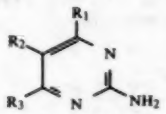
II

with chlorosulfonylisocyanate into a 1-methanesulfonyl-1-methyl -3-(N-methanesulfonyl-N-methylaminosulfonyl) urea derivative of the formula:



III

and then, in a second stage, converting the 1-methanesulfonyl-1-methyl-3-(N-methanesulfonyl-N-methylaminosulfonyl) urea derivative with a 2-aminopyrimidine of formula:



IV

wherein R_1, R_2 and R_3 have the above-mentioned meaning, into the end product.

5,180,827

2-(3-PYRIDYL) PROPANENITRILE DERIVATIVES

Alain Gadras, Lyons, and Regis Pepin, Rilleux La Pape, both of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

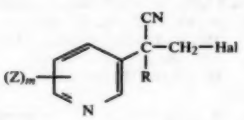
Division of Ser. No. 326,004, Mar. 20, 1989, Pat. No. 4,999,357. This application Dec. 31, 1990, Ser. No. 636,106

Claims priority, application France, Mar. 29, 1988, 88 04411

Int. Cl.[5] C07F *7/02*; C07D *213/57, 213/78*

U.S. Cl. 546—14 **10 Claims**

1. A compound of the formula



(V)

wherein:

Hal denotes a halogen atom;

R denotes:

a lower alkyl radical, optionally substituted with one or more substituents selected from the group consisting of halogen atoms, lower alkoxy radicals, lower alkylthio radicals and a radical

$(CH_2)_xSiR_1R_2R_3$, wherein x is 0 or 1 and R_1, R_2 and R_3, which may be identical or different, are lower alkyl, lower alkoxy, aryl or aralkyl;

a 3- to 7-membered cycloalkyl radical selected from the group consisting of cyclopropyl, cyclobutyl, cyclopentyl and cyclohexyl, which is optionally substituted in the same manner as the lower alkyl radical;

an aralkyl radical optionally substituted in the same manner as the lower alkyl radical; or

a mono- or polyunsaturated lower alkenyl or alkynyl radical, optionally substituted in the same manner as the lower alkyl radical, with the proviso that there is no unsaturation at the alpha-position with respect to the carbon bearing the CN group;

Z denotes a lower alkyl or lower alkoxy radical; and

m denotes 0, 1 or 2, the groups Z being identical or different when m is 2.

5,180,828

CHROMOPHORIC REAGENTS FOR INCORPORATION OF BIOTIN OR OTHER HAPTENS INTO MACROMOLECULES

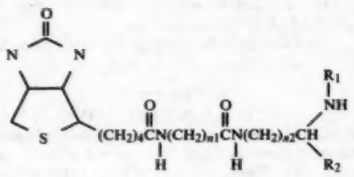
Vartan Ghazarossian; Viola T. Kung, both of Menlo Park, and Robert F. Zuk, Burlingame, all of Calif., assignors to Molecular Devices Corporation, Menlo Park, Calif.

Continuation of Ser. No. 477,545, Feb. 9, 1990, abandoned. This application Apr. 9, 1992, Ser. No. 865,641

Int. Cl.[5] C07D *491/16, 513/04*; G01N *33/543*

U.S. Cl. 546—37 **1 Claim**

1. A compound of the formula:



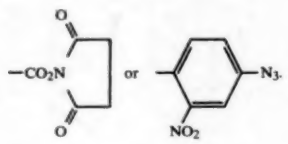
wherein

n_1 is 1, 2, 3, 4, 5, 6 or 7;

n_2 is 0, 1, 2, 3, 4, 5, 6 or 7;

R_1 is either a carboxytetramethyl-rhodamyl, sulforhodamyl 101, or dinitrophenylaminohexanoyl group; and

R_2 is $-CO_2H$, $-NH_2$, $-SH$,



5,180,829

SUBSTITUTED 1-HYDROXY-2,6-DIARYL-4-ACYLOXYPIPERIDINES OR 1-HYDROXY-2,6-DIARYL-4-ACYLAMINOPIPERIDINES AND STABILIZED COMPOSITIONS

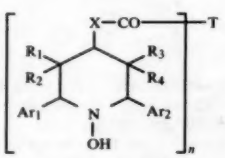
Glen T. Cunkle, Stamford, Conn.; Ramanathan Ravichandran, Nanuet, and Donald J. Sabrsula, Peekskill, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 7, 1991, Ser. No. 696,695

Int. Cl.[5] C07D *211/00, 211/32*

U.S. Cl. 546—188 **12 Claims**

1. A compound which is a substituted 1-hydroxy-2,6-diaryl-4-acyloxypiperidine or 1-hydroxy-2,6-diaryl-4-acylaminopiperidine of formula I



(I)

wherein

n is 1,2,3 or 4;

X is —O— or —NE—,

E is hydrogen, alkyl of 1 to 20 carbons or cycloalkyl of 5 to 12 carbon atoms,

Ar_1 and Ar_2 are independently carbocyclic aryl of 6 to 10 carbon atoms; or said aryl substituted by one to three substituents selected from the group consisting of alkyl of

1 to 20 carbon atoms; cycloalkyl of 5 to 12 carbon atoms; phenylalkyl of 7 to 15 carbon atoms; —$COOR_5$ where R_5 is hydrogen or alkyl of 1 to 20 carbons; —COR_6 where R_6 is alkyl of 1 to 20 carbons; —NR_7R_8 where R_7 and R_8 are independently hydrogen or alkyl of 1 to 20 carbons; —SR_9 where R_9 is carbocyclic aryl of 6 to 10 carbon atoms or alkyl of 1 to 20 carbon atoms; —OH; —OCH_3; —CN; —CF_3; —NO_2; —F; —Cl; —Br and —I;

R_1, R_2, R_3 and R_4 are independently hydrogen; a linear or branched alkyl of 1 to 30 carbon atoms; or said alkyl terminated with —OR_{10}, —$NR_{11}R_{12}$, —SR_{13}, —$COOR_{14}$ or —$CONR_{15}R_{16}$, where R_{10}, R_{11}, R_{12}, R_{13} and R_{14} are independently alkyl of 1 to 20 carbon atoms or alkenyl of 3 to 18 carbon atoms, and R_{15} and R_{16} are independently hydrogen or the same meaning as R_{10}; or said alkyl interrupted by one or two —O—, —S—, —SO—, —SO_2—, —CO—, —COO—, —OCO—, —$CONR_{17}$—, —NR_{17}CO—or —NR_{18}— where R_{17} and R_{18} have the same meaning as R_{15}; alkenyl of 3 to 20 carbon atoms; carbocyclic aryl of 6 to 10 carbon atoms; or said aryl substituted by one to three substituents selected from the group consisting of alkyl of 1 to 20 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, and phenylalkyl of 7 to 15 carbon atoms; and

when n is 1, T is alkyl of 1 to 20 carbon atoms or said alkyl interrupted by one or two of —O—, —S—, —SO—, —SO_2—, —CO—, —COO—, —OCO—, —$CONR_{19}$—, —NR_{19}CO—or —NR_{20}— where R_{19} and R_{20} have the same meaning as R_{15}; or aryl or substituted aryl having the same definition as Ar_1;

when n is 2, T is a direct bond; alkylene of 1 to 12 carbon atoms, or said alkylene interrupted by one or two of —O—, —S—, —SO—, —SO_2—, —CO—, —COO—, —OCO—, —$CONR_{21}$, —NR_{21}CO— or —NR_{22}— where R_{21} and R_{22} have the same meaning as R_{15};

when n is 3, T is alkanetriyl of 3 to 8 carbon atoms; and

when n is 4, T is alkanetetrayl of 4 to 10 carbon atoms.

5,180,830

PROCESS FOR PREPARING HINDERED AMINE LIGHT STABILIZERS

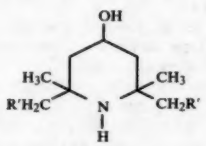
Gleason O. Cookson, Taunton, Mass.; Vu A. Dang, Bear, and Krishna Raman, Wilmington, both of Del., assignors to Himont Incorporated, Wilmington, Del.

Filed Apr. 24, 1991, Ser. No. 690,760

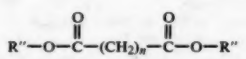
Int. Cl.[5] C01D *401/12*

U.S. Cl. 546—222 **17 Claims**

1. A process for preparing hindered amine light stabilizers by reacting (a) an alkyl substituted-4-hydroxypiperidine having the following general formula:



where R' is hydrogen or methyl, with (b) a dicarboxylic acid ester of the formula:



where R'' and R''' are a C_1–C_{12} linear or branched alkyl, a C_5–C_{12} cycloalkyl, a C_6–C_{12} aryl or a C_7–C_{12} alkaryl or aralkyl and may be the same or different, and n is a number from 1–12, in the presence of a polar aprotic organic compound and basic inorganic compound catalyst system, wherein a 2:1 to 3.2:1 mole ratio of alkyl substituted-4-hydroxypiperidine to dicarboxylic acid ester is used, and said polar aprotic compound has sufficient polarity to dissolve the ingredients at the reaction temperature and is capable of complexation with the metal ion of said basic inorganic compound.

5,180,831

QUATERNARY PYRIDINIUM COMPOUNDS

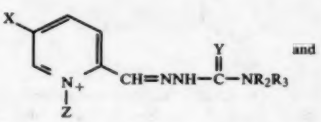
James C. Powers; Sheldon W. May, both of Atlanta; Maria A. Hernandez, Norcross, all of Ga.; Steve Thornton, Raleigh, N.C., and Jan Glinski, New Fairfield, Conn., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Aug. 10, 1990, Ser. No. 565,520

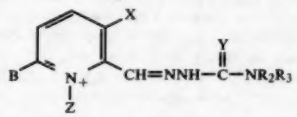
Int. Cl.[5] C07D *213/65, 213/46, 213/52, 213/53, 401/06*

U.S. Cl. 546—291 **3 Claims**

1. A compound of the group consisting of the formulas:



and



and any counterion to make pharmaceutically acceptable salts, wherein

Z is selected from the group consisting of C_{1-6} alkyl, C_{1-6} alkyl with an attached phenyl group, C_{1-6} alkyl with an attached naphthyl group, C_{1-6} alkyl with two attached phenyl groups, C_{1-6} alkyl with an attached phenyl group mono, di or trisubstituted with J, C_{1-6} alkyl with two attached phenyl groups mono, di or trisubstituted with J, C_{1-6} alkyl with an attached naphthyl group mono, di, or trisubstituted with J,

wherein J is selected from the group consisting of halogen, COOH, OH, CN, NO_2, NH_2, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylamine, C_{1-6}, alkyl-O-CO-, C_{1-6} alkyl-O-CO-NH-, C_{1-6} alkyl-NH—CO—NH-, C_{1-6} alkyl-NH—CO—O—, C_{1-6} aklyl NH—CO—, $(C_{1-6}$ alkyl$)_2$N-CO-,

wherein X is selected from the group consisting of OH, C_{1-6} alkyl-NH—CO—O—,$(C_{1-6}$ alkyl$)_2$-N—CO—O, C_{1-6} fluoroalkyl-NH—CO—O, $(C_{1-6}$ fluoroalkyl$)_2$-NH—CO—O,

Y is O or S,

wherein R_2 is selected from the group consisting of H, C_{1-6} alkyl, phenyl, C_{1-6} alkyl with an attached phenyl group, C_{1-6} alkyl with an attached phenyl group mono, di, or trisubstituted with K, C_{1-6} alkyl with an attached naphthyl group, C_{1-6} alkyl with an attached naphthyl group mono, di, or trisubstituted with K,

wherein R_3 is selected from the group consisting of H, C_{1-6} alkyl, phenyl, C_{1-6} alkyl with an attached phenyl group, C_{1-6} alkyl with an attached phenyl group mono, di or trisubstituted with K,

wherein K is selected from the group consisting of halogen, COOH, OH, CN, NO_2, NH_2, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylamine, C_{1-6} alkyl-O-CO-, C_{1-6} alkyl-O-CO-NH-, C_{1-6} alkyl-NH—CO—NH—, C_{1-6} alkyl-NH—CO—O—, C_{1-6} alkyl NH—CO—, $(C_{1-6}$ alkyl$)_2$N-CO-,

wherein B is selected from the group consisting of H, C_{1-6} alkyl.

5,180,832

(3-PYRIDINYL)METHANONE OXIME DERIVATIVES

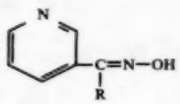
Eddy J. E. Freyne, Rumst; Alfons H. M. Raeymaekers, Beerse; Victor Sipido, Merksem, all of Belgium, and Marc G. Venet, Paris, France, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 356,592, May 23, 1989, Pat. No. 4,963,573, which is a continuation of Ser. No. 156,513, Feb. 16, 1988, abandoned, which is a continuation of Ser. No. 888,670, Jul. 23, 1986, Pat. No. 4,746,671, which is a continuation-in-part of Ser. No. 794,999, Nov. 4, 1985, abandoned. This application Sep. 17, 1990, Ser. No. 583,758

Int. Cl.[5] C07D *213/53, 213/46*

U.S. Cl. 546—333 **9 Claims**

1. A compound of the formula:



(II)

an N-oxide form, an alkali or alkaline earth metal substitution salt, or a stereochemically isomeric form thereof, wherein:

R represents phenyl or naphthalenyl wherein said phenyl and naphthalenyl are each optionally substituted with up to 2 substituents being each independently selected from the group consisting of C_{1-6}alkyloxy, di(C_{1-6}alkyloxy)-methyl, formyl, and trifluoromethyl provided that R represents other than unsubstituted phenyl.

5,180,833

PROCESS FOR THE PREPARATION OF CHLOROTHIAZOLE DERIVATIVES

Hideki Uneme, Osaka; Noriko Higuchi, Matsubara, and Isao Minamida, Kawabe, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

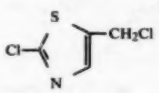
Filed Mar. 7, 1991, Ser. No. 666,128

Claims priority, application Japan, Mar. 16, 1990, 2-67911

Int. Cl.[5] C07D *277/32*

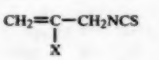
U.S. Cl. 548—202 **11 Claims**

1. A process for preparing 2-chloro-5-(chloromethyl)-thiazole represented by



[I]

which comprises reacting an allyl isothiocyanate derivative represented by the formula



[II]

wherein X represents a leaving group selected from the group consisting of halogen; C_{1-4} alkylsulfonyloxy unsubstituted or substituted by 1 to 3 halogen atoms which may be the same or different; C_{6-10} arylsulfonyloxy unsubstituted or substituted by 1 to 4 substituents, which may be the same or different, selected from the group consisting of lower alkyl and halogen atoms; and C_{1-6} acyloxy unsubstituted or substituted by 1 to 3 halogen atoms which may be the same or different; with a chlorinating agent.

5,180,834

6,7-DIHYDRO-3-PHENYL-1,2-BENZISOXAZOL-4(5H)-ONES

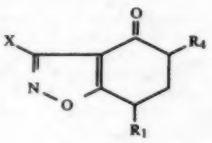
David G. Wettlaufer, Phillipsburg; Gregory M. Shutske, Flemington, and Peter A. Nemoto, Piscataway, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Division of Ser. No. 692,341, Apr. 26, 1991, Pat. No. 5,114,936, Continuation-in-part of Ser. No. 571,482, Aug. 23, 1990, abandoned. This application Feb. 28, 1992, Ser. No. 843,330

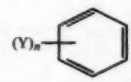
Int. Cl.[5] C07D *261/20*

U.S. Cl. 548—241 **1 Claim**

1. A compound of the formula



where X is



or loweralkyl; Y is selected from hydrogen, halogen, loweralkyl, loweralkoxy, CF_3, NO_2 and NH_2; R_1 is hydrogen and R_4 is loweralkoxycarbonyl, n is an integer of 1 to 4 or aryloxycarbonyl.

5,180,835

PROCESS FOR THE PREPARATION OF MONOMERIC TETRAMETHOXYMETHYLGLYCOLORIL

William Jacobs, III, Bethel; Fred W. Luciw, Stamford, both of Conn.; Ilze B. Kancans, Hartsdale, N.Y.; Daniel W. Thomas, Bridgewater, N.J.; Leslie Boldizer, and Robert G. Lees, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 25, 1991, Ser. No. 720,302

Int. Cl.[5] C07D *487/04*

U.S. Cl. 548—303.4 **13 Claims**

1. In a process for the preparation of tetramethoxymethylglycoluril of the type having the sequential steps of (I) methylolating glycoluril with formaldehyde, (II) etherifying with methanol in a volatile solvent, and (III) isolating the tetramethoxymethylglycoluril product, the improvement comprising adding between steps (II) and (III) the sequential steps of:

(IIa) separating the volatiles by distilling at a pH in the range of from about 5.0 to less than 7, at a temperature, pressure, and for a length of time sufficient to produce substantially fully methylolated, partially etherified, substantially monomeric tetramethoxymethylglycoluril, and

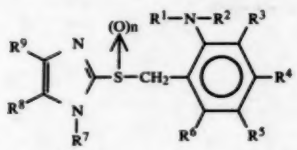
(IIb) etherifying further the partially etherified tetramethoxymethylglycouril of step (IIa) with added methanol under acidic conditions to produce a substantially fully methylolated, substantially fully etherified, substantially monomeric tetramethoxymethylglycouril having a monomeric tetramethoxymethylglycoluril content in the range of from about 80 weight percent to 100 weight percent, a methoxy to methylene ratio in the range from about 0.95 to about 1.00, and a methylene to glycoluril ratio in the range of from about 3.7 to about 4.00.

5,180,836
IMIDAZOLE DERIVATIVES

Susumu Okabe, Kyoto; Mitsuo Masaki; Tomio Yamakawa, both of Chiba; Hitoshi Matsukura, Saitama, and Yutaka Nomura, Chiba, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

Division of Ser. No. 658,424, Feb. 20, 1991, Pat. No. 5,082,943, which is a continuation of Ser. No. 392,364, Aug. 10, 1989, abandoned. This application Nov. 1, 1991, Ser. No. 786,392
Claims priority, application Japan, Aug. 10, 1988, 63-199528; Nov. 24, 1988, 63-297856
Int. Cl.[5] C07D *235/30, 473/30*
U.S. Cl. 548—302.7 8 Claims

1. An imidazole derivative having the formula



wherein

each of R^1 and R^2 independently is hydrogen, an alkyl group having 1–8 carbon atoms, a cycloalkyl group having 5–8 carbon atoms, an aryl group, an aralkyl group having 1–4 carbon atoms in its alkyl chain, or a halogen atom-substituted alkyl group having 1–8 carbon atoms;

each of R^3, R^4, R^5 and R^6 independently is hydrogen, a halogen atom, an alkoxy group having 1–6 carbon atoms, an aralkyloxy group having 1–4 carbon atoms in its alkyl chain, an alkyl group having 1–6 carbon atoms, an alkoxycarbonyl group having 2–7 carbon atoms, nitro, amino, an acyl having 1–6 carbon atoms, a fluorine substituted alkyl group having 1–6 carbon atoms, or a fluorine substituted alkoxy group having 1–6 carbon atoms;

R^8 and R^9 are combined to form, together with two carbon atoms of the imidazole ring to which R^8 and R^9 is attached, a 5–8 membered alicyclic ring;

R^7 is hydrogen, an alkyl group having 1–6 carbon atoms which may have at least one substituent selected from the group consisting of an aryl group, hydroxyl, an alkoxy group having 1–6 carbon atoms, and a halogen atom, an aryl group which may have at least one substituent selected from the group consisting of an alkyl group having 1–6 carbon atoms, an alkoxy group having 1–6 carbon atoms, and a halogen atom, an arylcarbonyl group which may have at least one substituent selected from the group consisting of an alkyl group having 1–6 carbon atoms, an alkoxy group having 1–6 carbon atoms, and a halogen atom; and

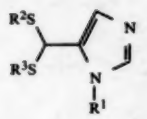
n is 0 or 1.

5,180,837
PILOSININE DERIVATIVES

Ulrich Heywang, Darmstadt; Michael Casutt, Heppenheim, and Michael Schwarz, Gross-Gerau, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Oct. 23, 1991, Ser. No. 781,608
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1990, 4033612
Int. Cl.[5] C07D *233/64, 405/06;* A61K *31/415*
U.S. Cl. 548—315.4 6 Claims

1. A compound which is a thioacetal of the formula II



II

wherein

R^1 is a straight-chain or branched alkyl chain with 1–6 C atoms,

R^2 and R^3 are each, identically or independently of one another, a low molecular weight alkyl group with 1–5 C atoms, phenylene or benzylene radicals optionally substituted by fluorine, chlorine, bromine, alkyl or alkoxy having up to 1–3 C atoms.

5,180,838
PHOTOTOXIC COMPOUNDS FOR USE AS INSECT CONTROL AGENTS

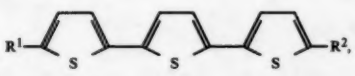
Peter Morand; John T. Arnason, both of Ottawa; Bernard J. R. Philogène, Gloucester; Anita M. MacEachern; Leonard C. Leitch, both of Ottawa, and Jerzy Kaminski, Gloucester, all of Canada, assignors to Her Majesty the Queen as represented by the Minister of National Defense of Her Majesty's Canadian Government, Canada

Division of Ser. No. 901,054, Aug. 26, 1986, Pat. No. 5,045,563.
This application Feb. 15, 1991, Ser. No. 656,272
Int. Cl.[5] C07D *409/14, 409/04;* A01N *43/10*
U.S. Cl. 549—59 6 Claims

1. A phototoxic terthienyl compound selected from the group consisting of

(a) compounds of Formula XIX:

FORMULA XIX

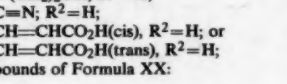


wherein:

1) R^1=R^2=CHO;
2) R^1=R^2=C≡N;
3) R^1=R^2=NO_2;
4) R^1=NH_2; R^2=H;
5) R^1=$(CH_2)_2OH$; R^2=H;
6) R^1=C≡N; R^2=H;
7) R^1=CH=$CHCO_2H$(cis), R^2=H; or
8) R^1=CH=$CHCO_2H$(trans), R^2=H;

(b) compounds of Formula XX:

FORMULA XX:

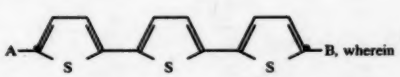


wherein

9) R^1=CH_3CH_2; and

(c) compounds of Formula XXV (where a dot indicates the point of attachment):

FORMULA XXV



-continued

10) A = H B = and R = Cl;

11) A = H B = and R = CH_3;

12) A = H B = and R = Br;

13) A = H B = and R = CF_3;

14) A = RO and R = H B = , and R′ = H;

15) A = RO and R = CH_3 B = , and R′ = H;

16) A = RO and R = CH_3, B = , and R′ = CH_3;

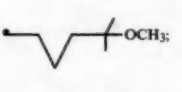
17) A = RO and R = CF_3, B = , and R′ = CH_3;

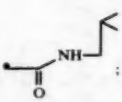
18) A = H B = , and R = CF_3;

19) A = H B = , and R = Cl;

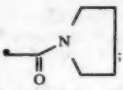
20) A = H B = , and R = Br;

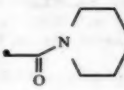
21) A = H B = , and R = CF_3;

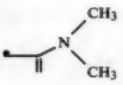
22) A = H, B =  ;

23) A = H, B =  ;

-continued

24) A = H, B =  ;

25) A = H, B =  ; and

26) A = H, B = 

5,180,839

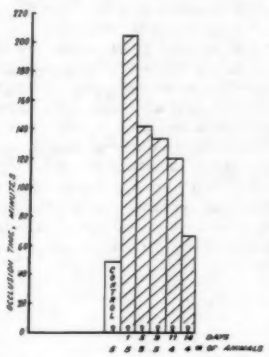
ANTI-THROMBOTIC COMPOUNDS

Philip N. Sawyer, 7600 Ridge Boulevard, Brooklyn, N.Y. 11209, and Leon D. Freeman, 101 Casabuena Dr., Corte Madera, Calif. 94925

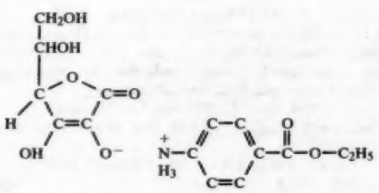
Division of Ser. No. 108,258, Dec. 2, 1987, Pat. No. 4,954,521, which is a division of Ser. No. 817,178, Jan. 9, 1986, Pat. No. 4,727,164, which is a continuation of Ser. No. 317,763, Nov. 3, 1981, abandoned, which is a division of Ser. No. 117,066, Jan. 31, 1980, Pat. No. 4,329,290, which is a continuation-in-part of Ser. No. 35,637, May 3, 1979, abandoned, which is a continuation of Ser. No. 701,874, Jul. 1, 1976, Pat. No. 4,164,585. This application Aug. 30, 1990, Ser. No. 575,515

Int. Cl.[5] C07D *307/32*

U.S. Cl. 549—316 **1 Claim**



1. P-carboethoxy phenyl ammonium ascorbate in the form of the 3-endic salt.



5,180,840

PROCESS FOR PREPARING ANALOGS OF ARTEMISININ

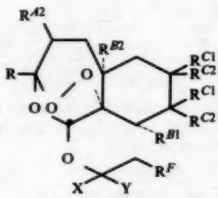
Mitchell A. Avery, Palo Alto, and Wesley K. M. Chong, Mountain View, both of Calif., assignors to SRI International, Menlo Park, Calif.

Division of Ser. No. 414,730, Sep. 27, 1989, Pat. No. 5,019,590, which is a continuation of Ser. No. 108,145, Oct. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 943,555, Dec. 18, 1986, abandoned. This application Feb. 19, 1991, Ser. No. 657,095

Int. Cl.[5] C07D *321/02*

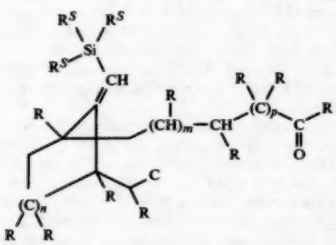
U.S. Cl. 549—348 7 Claims

1. A process for preparing a polyoxatetracyclic compound of the formula



wherein the R's are each independently selected from the group consisting of hydrogen and a lower alkyl of 1 to 4 carbon atoms and X and Y are selected such that they together equal a carbonyl oxygen or X is a hydrogen while Y is selected from the group consisting of hydrogen, hydroxyl, alkyloxy, alkylcarbonyloxy, hydroxycarbonyloxy, alkylaminocarbonyl, alkylaminocarbonyloxy and ureido which comprises

(a) subjecting to ozonolysis a carbonyl/ester vinylsilane of the formula



wherein each R save R^E is said hydrogen or lower alkyl; m is O; and R^E is a protecting esterifying group thereby forming an ozonolysis product, and

(b) treating the ozonolysis product with an acid having a pKa of from about 5 to about 0.1.

5,180,841

PREPARATION OF 1-AMINO-2-CHLORO-4-HYDROXYANTHRAQUINONE

Gerhard Epple, Weisenheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 22, 1992, Ser. No. 823,814

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1991, 4101875

Int. Cl.[5] C07C *221/00*

U.S. Cl. 522—244 3 Claims

1. A process for preparing 1-amino2-chloro-4-hydroxyanthraquinone, which comprises chlorinating 1-amino-4-hydroxy-2,3-dihydroanthraquinone with at least 2 mol of chlorine in concentrated sulfuric acid.

5,180,842

PURIFICATION OF QUINONES

Yeong-Jen Kuo, and Michael Bellas, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 16, 1991, Ser. No. 745,774

Int. Cl.[5] C07C *50/04*

U.S. Cl. 552—293 3 Claims

1. Process for obtaining a quinone compound containing less than 50 ppm chlorine which comprises the steps of:

(1) intimately contacting a quinone compound containing at least 1000 ppm chlorine with heptane, cyclohexane or a mixture thereof at elevated temperature; and

(2) separating the quinone compound from the mixture of step (1) to obtain the quinone compound containing less than 50 ppm chlorine.

5,180,843

TERMINAL SUBSTITUTED SILICONE FATTY ESTERS

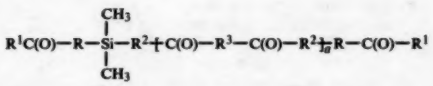
Anthony J. O'Lenick, Jr., 743 Ridgeview Dr., Norcross, Ga. 30247

Continuation-in-part of Ser. No. 539,558, Jun. 18, 1990, Pat. No. 5,136,063. This application Sep. 16, 1991, Ser. No. 760,760

Int. Cl.[5] C09F *5/08, 7/10;* C07F *7/08*

U.S. Cl. 556—77 20 Claims

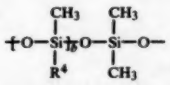
1. A silicone ester which conforms to the following structure;



R is $-(CH_2)_3-O-(CH_2CH_2-O)_x-(CH_2(CH_3)-CH-O)_y-(CH_2CH_2-O)_z-$

x, y and z are integers independently ranging from 0 to 20;

R^2 is



R^1 is alkyl having 12 to 18 carbon atoms;

R^3 is selected from $-(CH_2)_c-$, or $-(CH_2)_d-CH=CH-(CH_2)_e-$;

a is an integer from 0 to 20;

b is an integer from 1 to 200;

c, d and e are independently integers from 1 to 10;

R^4 is alkyl having from 1 to 18 carbon units or phenyl.

5,180,844

OPTICALLY ACTIVE 2-METHYLENECYCLOPENTANONE DERIVATIVE AND PROCESS FOR PREPARING SAME

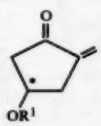
Takashi Takahashi, Kanagawa, and Yoshikazu Takehira, Hyogo, all of Japan, assignors to Daiso Co., Ltd., Osaka, Japan

Filed Jul. 9, 1991, Ser. No. 727,219

Int. Cl.[5] C07F *7/04, 7/08;* C07D *319/06;* C07C *49/105*

U.S. Cl. 556—436 2 Claims

1. A 2-methylenecyclopentanone derivative represented by the general formula



(IX)

(wherein R^1 is a protective group for hydroxyl, and the symbol * represents an asymmetric carbon atom).

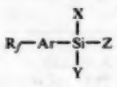
5,180,845

THERMALLY STABLE, FLUORINE-CONTAINING ORGANSILANES

David P. Higley, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 7, 1992, Ser. No. 864,954
Int. Cl.[5] C07F *7/08, 7/18*
U.S. Cl. 556—445 **9 Claims**

1. An organosilane having the following formula (1):



(1)

where R_f has at most 18 carbon atoms and is selected from the group consisting of

(a) perfluoroalkyl groups having at least 4 carbon atoms

(b) $-[CF_2CF(CF_3)O]_n-CF_2-CF_2-CF_3$, where n is an integer of at least 1;

(c) $-CF_2-(CF_2-O)m-CF_3$, where m is an integer of at least 2; and

(d) $-CH_2-C(CF_3)_2-CF_2-CF_2-CF_3$;

Ar is a divalent aromatic radical;

X is selected from the group consisting of

(e) methyl;

(f) R_f—Ar as defined above;

(g) halogen atoms selected from the group consisting of chlorine, bromine, and iodine; and

(h) alkoxy groups; and

each of Y and Z independently is selected from the group consisting of

(i) halogen atoms selected from the group consisting of chlorine, bromine, and iodine; and

(j) alkoxy groups.

5,180,846

HYDROGENATION OF ENZYMATICALLY-PRODUCED GLYCOLIC ACID/AMINOMETHYLPHOSPHONIC ACID MIXTURES

David L. Anton; Robert DiCosimo, both of Wilmington, Del., and Earnest W. Porta, Landenberg, Pa., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Nov. 6, 1991, Ser. No. 788,648
Int. Cl.[5] C07F *9/38*
U.S. Cl. 562—17 **9 Claims**

1. A process for preparing N-(phosphonomethyl)glycine which comprises hydrogenating a mixture, wherein said mixture is enzymatically produced by reacting glycolic acid and oxygen in an aqueous solution containing aminomethylphosphonic acid and the enzymes glycolate oxidase and catalase.

5,180,847

PROCESSES FOR PREPARING 2,2,4-TRIMETHYL-1,3-PENTANEDIOL DERIVATIVES

Laurance R. Thurman, Clute, and James B. Harris, Pearland, both of Tex., assignors to BASF Corporation, Parsippany, N.J.

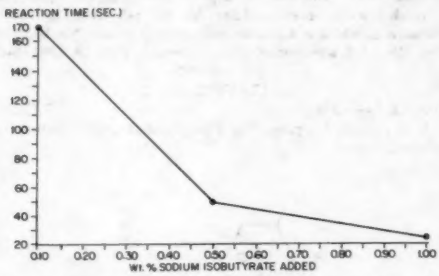
Filed Feb. 15, 1991, Ser. No. 656,789
Int. Cl.[5] C07C *67/00, 69/28*
U.S. Cl. 560—238 **34 Claims**

1. A process for producing 3-hydroxy-2,2,4-trimethylpentyl isobutyrate, comprising the steps of:

reacting isobutyraldehyde in the presence of an alkali metal hydroxide to produce a reacted medium containing 3-hydroxy-2,2,4-trimethylpentyl isobutyrate and an alkali metal isobutyrate salt;

separating from said reacted medium, an aqueous medium containing the alkali metal isobutyrate salt;

removing water from said aqueous medium to concentrate it so as to contain at least about 12.5 weight % of the alkali metal isobutyrate salt; and



introducing the concentrated alkali metal isobutyrate salt medium into a subsequent one of said reacting steps to increase the reaction rate.

5,180,848

SYNTHESIS OF PHOSPHINOACETIC ACIDS

An-hsiang Wu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 7, 1991, Ser. No. 788,909
Int. Cl.[5] C07C *53/00, 3/00*
U.S. Cl. 562—405 **21 Claims**

1. A process for preparing at least one P,P-dihydrocarbylphosphinoacetic acid comprising the steps of:

(a) reacting at least one 2-methyl-4,4-dialkyl-2-oxazoline, wherein each of the two alkyl groups can contain 1–6 carbon atoms, with at least one basic compound of the formula MZ, wherein M is an alkali metal and Z is selected from the group consisting of —H, —OR′, $-NH_2$, —NHR′ and $-N(R')_2$, with R′ being an alkyl or cycloalkyl group having 1–8 carbon atoms, at a temperature not to exceed about 0° C. for a time period of at least about 1 second;

(b) adding to the reaction mixture obtained in step (a), at a temperature not to exceed about 0° C., at least one halodihydrocarbylphosphine having the general formula R_2PX, wherein X is Cl or Br or I, and each R is selected from the group consisting of alkyl groups containing 1–10 carbon atoms, cycloalkyl groups containing 3–10 carbon atoms and aryl groups containing 6–12 carbon atoms;

(c) heating the mixture obtained in step (b) to a temperature of above about 0° C. and maintaining the mixture at that temperature for a time of at least about 1 minute;

(d) contacting the reaction mixture obtained in step (c) with at least one mineral acid under such conditions as to form said at least one P,P-dihydrocarbylphosphinoacetic acid; and

(e) recovering said at least one P,P-dihydrocarbylphosphinoacetic acid from the reaction mixture obtained in step (d).

5,180,849

PROCESS FOR PRODUCING PURIFIED TEREPHTHALIC ACID

Norio Taniguchi, Wakicho, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jul. 3, 1991, Ser. No. 725,426
Claims priority, application Japan, Jul. 4, 1990, 2-177965
Int. Cl.[5] C07C *51/265, 51/487*
U.S. Cl. 562—414 **6 Claims**

1. In a process for producing purified terephthalic acid which comprises catalytically oxidizing p-xylene in liquid

phase to produce crude terephthalic acid containing 4-carboxybenzaldehyde as a main impurity therein, and treating the crude terephthalic acid with hydrogen in the presence of a palladium, ruthenium, rhodium, osmium, iridium, platinum, platinum black, palladium black, iron, or cobalt-nickel hydrogenation catalyst in a reaction vessel, thereby to produce purified terephthalic acid containing 4-carboxybenzaldehyde in an amount of fixed range in a stationary manner at a temperature of 255°–300° C. and under a pressure of 10–110 Kg/cm^2 with a partial pressure of hydrogen being 0.5–20 Kg/cm^2, the improvement comprising exchanging the hydrogenation catalyst in the reaction vessel in part for a new one when the catalyst is deactivated, and thereafter feeding into the reactor crude terephthalic acid which contains 4-carboxybenzaldehyde in an amount larger than that in the stationary state of the treatment for restarting the treatment of the crude terephthalic acid, and treating the terephthalic acid until the treatment reaches the stationary state.

5,180,850

CRYSTALLINE MAGNESIUM VALPORATE AND A METHOD FOR THE PREPARATION THEREOF

Claudio Cavazza, Roma, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Dec. 13, 1990, Ser. No. 626,910
Claims priority, application Italy, Dec. 22, 1989, 22837 A/89
Int. Cl.[5] C07B *53/00*; A01N *37/00*; A61K *31/19*
U.S. Cl. 562—606 **3 Claims**

1. A method of preparing magnesium valproate which comprises reacting valproic acid and a magnesium alkoxide selected from magnesium ethoxide, propoxide and isopropoxide in stoichiometric proportions in an alcoholic solvent selected from methanol and ethanol at room temperature and recovering magnesium valproate from the reaction mixture.

5,180,851

PREPARATION OF N-(L-ALKOXYALKYL)FORMAMIDE AND ALKYLIDENE BISFORMAMIDES USING AMINE NEUTRALIZED ION EXCHANGE RESINS

Mark L. Listemann, Whitehall, and Robert K. Pinschmidt, Jr., Allentown, both of Pa., assignors to Air Products and Chemicals Inc., Allentown, Pa.

Filed Mar. 21, 1991, Ser. No. 672,812
Int. Cl.[5] C07C *231/02*
U.S. Cl. 564—134 **16 Claims**

1. In a process for the preparation of N-(1-alkoxyalkyl)amides and alkylidene bisamides wherein an alkylamide is reacted with an ether containing composition in the presence of an acid catalyst, the improvement for producing N-(1-alkoxyalkyl)formamides and alkylidene bisformamides which comprises:

(a) reacting formamide with an ether containing composition selected from the group consisting of an acetal or hemiacetal carboxylate ester represented by the formulas:

I

II

wherein R is C_1–C_8 alkyl, hydrocarbyl aralkyl or hydrocarbyl aryl; R_1 and R_2 are independently C_1–C_8 alkyl, or hydrocarbyl aryl; and R_3 is secondary or tertiary alkyl having from 3–8 carbon atoms and

(b) effecting said reaction of formamide with said acetal or hemiacetal carboxylate ester in the presence of a strong acid ion exchange resin neutralized with an amine having a basicity expressed as pKa of the protonated amine in water ranging from about 4 to 9.

5,180,852

PREPARATION OF BIS(ORGANOTHIO) ALKANES

James E. Shaw, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 767,592, Sep. 30, 1991, Pat. No. 5,132,008.
This application Feb. 19, 1992, Ser. No. 837,839
Int. Cl.[5] C07C *319/18*
U.S. Cl. 568—57 **18 Claims**

1. A process for preparing a bis(organothio) alkane having the formula of RCH(SR″)CH(SR″)R′ comprising contacting an alkene having the formula of RCH=CHR′ with an amount of a thiolating agent having the formula of R″SSR″ in the presence of a catalyst, wherein said amount is from about 1.2 to about 10.0 in terms of mole ratio of said thiolating agent to said alkene, wherein said catalyst is selected from the group consisting of boron trichloride, boron tribromide, boron trifluoride, aluminum chloride, and a boron trifluoride dialkyl etherate. and wherein R is an alkyl group having 1 to 20 carbon atoms, R′ is hydrogen and R″ is an alkyl or aryl group having 1 to 10 carbon atoms.

5,180,853

4,4-6,6-TETRONITROADAMANTAN-2-ONE

Paritosh R. Dave, 1 Rustic Ridge Rd., A37, Little Falls, N.J. 07424

Filed May 4, 1992, Ser. No. 878,283
Int. Cl.[5] C07C *79/36, 79/08*; C06B *25/00*
U.S. Cl. 568—305 **1 Claim**

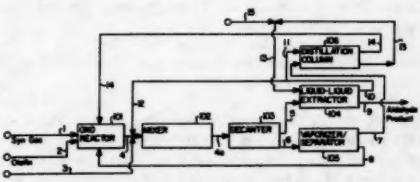
1. 4,4,6,6-Tetranitroadamantan-2-one.

5,180,854

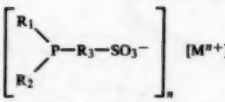
PROCESS FOR CATALYST ALDEHYDE PRODUCT SEPARATION

Anthony G. Abatjoglou, Charleston; David R. Bryant, So. Charleston, and Ronald R. Peterson, St. Albans, all of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 373,206, Jul. 5, 1989, abandoned, which is a continuation-in-part of Ser. No. 218,911, Jul. 14, 1988, abandoned. This application Mar. 18, 1992, Ser. No. 853,009
Int. Cl.[5] C07C *45/50, 45/78*
U.S. Cl. 568—454 **59 Claims**



1. A process for separating aldehyde from a non-aqueous hydroformylation reaction product composition comprising an aldehyde containing from 7 to 31 carbon atoms, a rhodium-phosphorus ligand complex, free phosphorus ligand, and an organic solubilizing agent for said complex and said free ligand, wherein the phosphorus ligand of said complex and said free phosphorus ligand is an ionically charged phosphorus ligand having the formula:



wherein R_1 and R_2 each individually represent a radical containing from 1 to 30 carbon atoms selected from the class consisting of alkyl, aryl, alkaryl, aralkyl and alicyclic radicals; wherein R_3 represents a divalent alkylene radical having from 2 to 12 carbon atoms or a divalent 1,3-phenylene radical; wherein M represents a metal cation selected from the group consisting of alkali and alkaline earth metals; and wherein n has a value of 1 or 2 corresponding to the valance of the particular metal cation represented by M, said process comprising (1) mixing said non-aqueous composition with from about 2 to about 60 percent by weight of added water and from 0 to about 60 percent by weight of an added non-polar hydrocarbon compound, said amounts of added water and added non-polar hydrocarbon compound being based on the total weight of said non-aqueous composition, and by phase separation forming a non-polar phase consisting essentially of aldehyde and the added non-polar hydrocarbon compound when employed, and a liquid polar phase consisting essentially of the added water, the rhodium-phosphorus complex, the free phosphorus ligand and the organic solubilizing agent for said complex and said free ligand; with the proviso that the amount of added water employed or the sum amount of added water and added non-polar hydrocarbon employed is at least sufficient to provide phase separation of at least about 70 weight percent of the aldehyde contained in said non-aqueous composition from at least about 90 weight percent of the rhodium-phosphorus complex calculated as rhodium metal also contained in said non-aqueous composition, and (2) recovering said non-polar phase from said polar phase.

5,180,855

PROCESS FOR THE PREPARATION OF CITRAL

Roland Jacquot, Sainte Foy Les Lyon, and Claude Mercier, Lyons, France, assignors to Rhone-Poulenc Nutrition Animale, Commentary, France

Filed Apr. 26, 1991, Ser. No. 690,829

Claims priority, application France, Apr. 27, 1990, 90 05380

Int. Cl.[5] C07C *45/51*

U.S. Cl. 568—486 **12 Claims**

1. A process for the preparation of citral, comprising cracking prenal diprenyl acetal in the vapor phase in the presence of a heterogeneous acid catalyst, said acid catalyst being selected from a group of catalysts that do not convert more than 30 % of citral to other products when a stream of citral at a flow rate of 4 ml/h is introduced into a reactor containing 1 ml of said catalyst between two 5 ml quartz beds heated to a temperature of 300° C. for one hour in the presence of a stream of nitrogen at a flow rate of 3 l/h, wherein the catalyst is selected from the group consisting of a zeolite, an oxide of a metal selected from columns IIIb to VIb of the periodic table of elements and phosphate, silicate or chromite salts.

5,180,856

POLYETHERS, THEIR PRODUCTION AND USE

Michael Stehr, Gelsenkirchen, and Heinz-Werner Voges, Dorsten, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 471,388, Jan. 29, 1990, abandoned. This application Aug. 12, 1991, Ser. No. 745,979

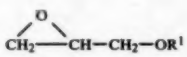
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1989, 3904488

Int. Cl.[5] C07C *43/11*

U.S. Cl. 568—617 **5 Claims**

1. A polyether obtained by the process consisting essentially of:

polymerizing tetrahydrofuran with a glycidyl ether having the formula:



in the presence of at least one alcohol having the formula R^2—OH, wherein R^1 is an alkyl group with 3–20 carbon atoms, and R^2 is an alkyl group with 8–24 carbon atoms, a cycloalkyl group with 6–12 carbon atoms in the ring, a hydroxyalkyl group with 4–36 carbon atoms, or a cycloalkanol group with 6–15 carbon atoms in the ring to form a polymer, said polymer having an osmotic molecular weight of 870–1920,

wherein the molar ratio of said alkanol to tetrahydrofuran and glycidyl ether is about 1:5 to 1:200, the molar ratio of tetrahydrofuran to glycidyl ether is about 1:6 to 15:1, and wherein the polymerization is carried out at a temperature of from about −10° C. to about 100° C. in the presence of 0.01–5 weight % of a Lewis acid catalyst.

5,180,857

REDUCTION OF MOLECULAR WEIGHT OF POLY(TETRAMETHYLENE ETHER) GLYCOL

Suriyanarayan Dorai, Lockport, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 10, 1992, Ser. No. 847,643

Int. Cl.[5] L07L *43/11*

U.S. Cl. 568—617 **22 Claims**

1. A process for preparing poly(tetramethylene ether) glycols having reduced molecular weights, without significant conversion of said poly(tetramethylene ether) glycols to tetrahydrofuran, comprising:

(a) reacting, as a starting material, a poly(tetramethylene ether) glycol having a number average molecular weight in the range between about 1000 and 25000 with a perfluorocarboxylic acid and an alkanol containing 1 to 3 carbon atoms, at a temperature of 100° C. to 250° C. for a reaction time of 0.1 to 8.0 hours under autogenous pressure to form a poly(tetramethylene ether) glycol ester said having a molecular weight lower than that of said poly(tetramethylene ether) glycol starting materials;

(b) converting said lower molecular weight ester having a pH value of about 7 to a poly(tetramethylene ether) glycol by reaction with an alcohol or water; and

(c) recovering from the reaction mixture a poly(tetramethylene ether) glycol having a number average molecular weight in the range between about 250 and 3500.

5,180,858

PROCESS FOR THE CATALYTIC HYDROGENATION OF LIQUID FATTY ACID METHYL ESTERS

Theo Fleckenstein, Hilden; Gerd Goebel, Cologne; Franz-Josef Carduck, Haan; Guenther Demmering, and Hans-Peter Kubersky, both of Solingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

PCT No. PCT/EP90/00597, § 371 Date Oct. 24, 1991, § 102(e) Date Oct. 24, 1991, PCT Pub. No. WO90/12775, PCT Pub. Date Nov. 1, 1990

PCT Filed Apr. 17, 1990, Ser. No. 768,882

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1989, 3913387

Int. Cl.[5] C07C *29/149, 31/04, 31/125*

U.S. Cl. 568—885 **30 Claims**

1. In a process for the catalytic hydrogenation of liquid saturated and unsaturated C_{6-24} fatty acid methyl esters for the production of saturated fatty alcohols and methanol in the presence of gaseous hydrogen and a hydrogenation catalyst under a pressure of from about 50 to about 300 bar and at a temperature in the range of from about 160 to about 250° C., the improvement wherein the process (a) is carried out under substantially isothermal conditions in a multiplicity of discrete tubular reaction zones (b) the reaction mixture comprises both a liquid phase and a gas phase, and the liquid phase and the gas phase are passed together in co-current flow over a stationary catalyst in each reaction zone without back-mixing, (c) between about 0.2 and about 2.5 liters of ester per liter of tubular reaction zone per hour is employed, (d) between about 1.5 and about 24 m^3 of ester is used per m^2 cross section of tubular reaction zone per hour, (e) the temperature and pressure in the tubular reaction zones are determined based on the activity of the catalyst employed in the reaction, and (f) the gas phase exiting the tubular reaction zones is received in the process.

5,180,859

PROCESS FOR THE PRODUCTION AND RECOVERY OF HALONITROALKANES IN HIGH YIELD

Larry D. Timberlake, West Lafayette, and James L. Brennan, Lafayette, both of Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Jul. 7, 1992, Ser. No. 910,005

Int. Cl.[5] C07C *205/01*

U.S. Cl. 568—946 **12 Claims**

1. In a method for the production and recovery of a halonitroalkane, the method including the preparation of the halonitroalkane in a reaction mixture at a final pH of at least about 5.0, the method further including the recovery of the halonitroalkane from the reaction mixture by azeotropic distillation, the improvement comprising:

adjusting the pH of the reaction mixture to pH=0–4 prior to distillation recovery of the halonitroalkane, and thereafter recovering the halonitroalkane by azeotropic distillation.

5,180,860

DEHYDROHALOGENATION PROCESS

Richard E. Fernandez, Bear, and Ralph B. Kaplan, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 28, 1990, Ser. No. 545,246

Int. Cl.[5] C07C *17/34*

U.S. Cl. 570—157 **7 Claims**

1. A process for preparing haloolefins containing a single double bond and at least one halogen substituent attached to an unsaturated carbon atom, which process comprises the following steps:

(1) contacting component (A) a saturated halohydrocarbon having a hydrogen substituent and a halogen substituent on adjacent saturated carbon atoms and at least one other halogen substituent on at least one of the adjacent saturated carbon atoms with component (B) a substantially molten alkali metal acid fluoride or a molten mixture thereof with an alkali metal fluoride.

5,180,861

PROCESS FOR THE PREPARATION OF POLYCHLORO-FLUORO-CYCLO-PENTENES

Hans-Helmut Schwarz, Krefeld; Rudolf Braden, Odenthal; Albrecht Marhold, Leverkusen, and Michael Negele, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 11, 1990, Ser. No. 595,914

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1989, 3936023

Int. Cl.[5] C07C *17/20*

U.S. Cl. 570—160 **13 Claims**

1. A process for the preparation of polychloro-fluoro-cyclopentenes having from 4 to 6 fluoro atoms by reaction of halogen-containing cyclic compounds having a 5-membered ring with hydrogen fluoride in the gas phase over a catalyst selected from the group consisting of catalysts wherein the essential active compound is a bismuth, lanthanide, or chromium containing compound, wherein hexachlorocyclopentadiene is employed as a starting material, hydrogen fluoride is present in an amount from about 7–40 mol per mol of halogen-containing cyclic compound, the reaction is carried out in the presence of from about 0.1–2 mol of Cl_2 per mol of starting material, and at a temperature in the range of from 300° to 450° C.

5,180,862

PROCESS FOR ISOMERIZING TRICHLOROBENZENE

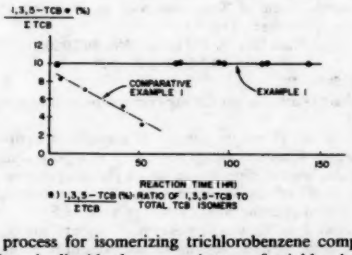
Kazuyoshi Iwayama, and Hiroaki Honda, both of Aichi, Japan, assignors to Toray Industries, Inc., Japan

Filed Sep. 3, 1991, Ser. No. 753,929

Claims priority, application Japan, Sep. 3, 1990, 2-233550

Int. Cl.[5] C07C *25/10, 17/00*

U.S. Cl. 570—202 **16 Claims**



1. A process for isomerizing trichlorobenzene comprising contacting, in liquid phase, a mixture of trichlorobenzene isomers containing trichlorobenzene selected from the group consisting of 1,3,5-trichlorobenzene and 1,2,3-trichlorobenzene in small concentrations with a catalyst selected from the group consisting of acid type mordenite zeolite and acid type beta zeolite, and a rhenium component and in the presence of hydrogen to increase concentrations of 1,3,5-trichlorobenzene and/or 1,2,3-trichlorobenzene in said mixture.

5,180,863

CONVERSION OF ALPHA-OLEFIN DIMER TO LIQUID LUBRICANT BASESTOCK

Thomas R. Forbus, Newtown, Pa., assignor to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 313,401, Feb. 21, 1989, Pat. No. 5,026,948. This application Jun. 17, 1991, Ser. No. 716,427

Int. Cl.[5] C07C *11/00*

U.S. Cl. 585—7 **6 Claims**

1. A novel lubricant composition comprising the reaction product of olefinic dimer, or mixtures thereof, in contact with

a Group 6 metal oxide disproportionation catalyst on a solid support under disproportionation reaction conditions, said dimer comprising the product of the oligomerization of C_6–C_{20} alpha-olefins in contact with reduced chromium oxide catalyst on silica support, wherein said disproportionation catalyst has been treated by oxidation at a temperature of 200° C. to 900° C. in the presence of an oxidizing gas and then by treatment with a reducing agent at a temperature and a time sufficient to reduce said catalyst.

5,180,864

PROCESS FOR OLIGOMERIZING OLEFINS USING AN ALUMINUM NITRATE-TREATED ACIDIC CLAY

John R. Sanderson, Leander, and John F. Knifton, Austin, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Apr. 30, 1990, Ser. No. 516,870

The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.

Int. Cl.[5] C10L *1/16*; C07C *2/02*

U.S. Cl. 585—10 **23 Claims**

1. A process for the preparation of oligomers, comprising the following steps:

(a) depositing a Lewis Acid, selected from the group consisting of aluminum nitrate, zinc chloride, and nickel chloride, on an acidic calcium montmorillonite clay having a moisture content ranging up to about 20 wt.%, a residual acidity in the range of about 3 to about 30 mg KOH/g and a surface area of about 300 M^2/g or greater, to provide a clay catalyst having a quantity of said Lewis Acid deposited thereon of at least about .01 wt.% ; and

(b) contacting a linear olefin containing from 10 to 24 carbon atoms with a catalytically effective amount of the Lewis Acid-treated clay of step (a).

5,180,865

BASE OIL FOR SHEAR STABLE MULTI-VISCOSITY LUBRICANTS AND LUBRICANTS THEREFROM

William J. Heilman, Houston, and Clifford G. Venier, The Woodlands, both of Tex., assignors to Pennzoil Products Company, Houston, Tex.

Filed Dec. 6, 1991, Ser. No. 802,980

Int. Cl.[5] C10M *107/08*

U.S. Cl. 585—10 **4 Claims**

1. A fully synthetic lubricating composition consisting essentially of:

(a) about 50–97 weight percent of a synthetic hydrocarbon selected from the group consisting of a poly-alphaolefin, an alkylated cyclopentane, an alkylated cyclopentadiene, an alkylated cyclopentene, an alkylated benzene, and alkylated cyclohexane, or mixtures thereof;

(b) about 3 to 50 weight percent of isobutylene oligomer, said isobutylene have a molecular weight of about 900 to 6,000, and a higher viscosity than said synthetic hydrocarbon, and

(c) up to about 5 weight percent of a lubricating additive, wherein the lubricating additive is selected from the group consisting of pour point depressants, viscosity index improvers, corrosion inhibitors, antioxidants, and mixtures thereof.

5,180,866

PROCESS FOR PREPARING SYNTHETIC LUBRICANT BASE STOCKS HAVING IMPROVED VISCOSITY FROM VINYLCYCLOHEXENE AND LONG-CHAIN OLEFINS

John R. Sanderson, Leander; Wheeler C. Crawford, Houston, and David R. McCoy, Austin, all of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Mar. 28, 1991, Ser. No. 676,492

Int. Cl.[5] C10M *107/22*; C07C *2/02*

U.S. Cl. 585—12 **17 Claims**

1. A process for preparing synthetic lubricant base stocks, comprising co-reacting vinylcyclohexene and linear olefins having from 10 to 24 carbon atoms in the presence of a Friedel-Crafts catalyst.

5,180,867

COPOLYMERIZATION OF DICYCLOPENTADIENE WITH NORBORNENE DERIVATIVES

Willem Sjardijn, and Johannes J. M. Snel, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 20, 1989, Ser. No. 438,148

Claims priority, application United Kingdom, Nov. 22, 1988, 8827264

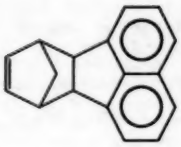
The portion of the term of this patent subsequent to Mar. 3, 2009, has been disclaimed.

Int. Cl.[5] C07C *13/61*

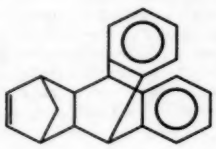
U.S. Cl. 585—22 **4 Claims**

1. A composition of matter which can be described by a chemical structure:

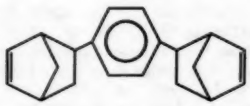
A



B



C



5,180,868

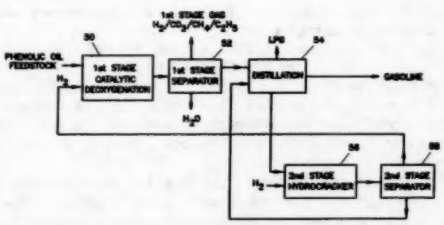
METHOD OF UPGRADING OILS CONTAINING HYDROXYAROMATIC HYDROCARBON COMPOUNDS TO HIGHLY AROMATIC GASOLINE

Eddie G. Baker, and Douglas C. Elliott, both of Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Continuation-in-part of Ser. No. 208,989, Jun. 20, 1988, abandoned. This application Oct. 9, 1990, Ser. No. 577,781

Int. Cl.[5] C07C *1/00*

U.S. Cl. 585—240 **24 Claims**



1. A multi-stepped method for producing highly aromatic gasoline, comprising the steps of:

deoxygenating unsaturated single and multiple ring hydroxyaromatic hydrocarbon compounds in a raw oil material at a temperature of 300° C.–450° C. so as to produce a deoxygenated oil material containing single and multiple ring aromatic compounds;

removing water from the deoxygenated oil material;

distilling the resulting deoxygenated oil material to remove single ring aromatic compounds as gasoline and leave a tenate;

after the distilling, cracking the multiple ring aromatic compounds remaining in the tenate in the presence of hydrogen and a dual function catalyst to produce a cracked oil material containing single ring aromatic compounds; and

distilling the cracked oil material to remove the single ring aromatic compounds as gasoline.

5,180,869

PROCESS FOR CO-REACTING POLY(ISOBUTYLENE) AND LINEAR OLEFINS TO PREPARE SYNTHETIC LUBRICANT BASE STOCKS HAVING IMPROVED PROPERTIES

John R. Sanderson, Leander, and Edward T. Marquis, Austin, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed May 14, 1991, Ser. No. 699,533

The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.

Int. Cl.[5] C07C *2/74*

U.S. Cl. 585—255 **20 Claims**

1. A process for the preparation of high viscosity synthetic lubricant base stocks, comprising contacting under effective oligomerization conditions

(1) a mixture of poly(isobutylene) and a linear olefin having from 10 to 24 carbon atoms, wherein up to about 10 wt. % of the mixture is poly(isobutylene), with

(2) a catalytically effective amount of an acidic calcium montmorillonite clay having a moisture content ranging up to about 20 wt. %, a residual acidity in the range of about 3 to about 30 mg KOH/g, and a surface area of about 300 m^2/g or greater.

5,180,870

HYDROGENATION OF POLYENES

Rocco A. Paciello, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 23, 1991, Ser. No. 781,361

Int. Cl.[5] C07C *5/02*

U.S. Cl. 585—277 **5 Claims**

1. A process for the hydrogenation of a polyene to a monoene which comprises forming a reaction mixture containing the polyene, hydrogen and a ruthenium-ligand complex hydrogenation catalyst, $Ru(PAr_3)_2(CO)_2Cl_2$ in which the triarylphosphine ligand $P(Ar)_3$ is selected from the group consisting of $P(p\text{-tolyl})_3$, $P(p\text{-F-}C_6H_4)_3$, $P(p\text{-OMe-}C_6H_4)_3$ or $P(C_6H_5)_3$, free triarylphosphine and a sterically-hindered tertiary amine promoter of the formula NR_3, where R is alkyl or aryl or a sterically-hindered pyridine having alkyl or aryl groups in the 2 and/or 6 position, and reacting the mixture under hydrogenation conditions, said sterically-hindered tertiary amine or said sterically-hindered pyridine being present in the reaction mixture in an amount in the range of 2 to 10 moles per mole of catalyst.

5,180,871

PROCESS FOR PRODUCING PHENOLS

Fujihisa Matsunaga; Hiroshi Fukuhara, and Mitsuki Yasuhara, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 657,363, Feb. 19, 1991, abandoned, which is a continuation of Ser. No. 266,940, Nov. 3, 1988, abandoned. This application Feb. 24, 1992, Ser. No. 839,683

Claims priority, application Japan, Nov. 11, 1987, 62-285001

Int. Cl.[5] C07C *15/02*

U.S. Cl. 585—400 **8 Claims**

1. A process for producing a phenol compound selected from the group consisting of phenol and derivatives thereof substituted with at least one substituent selected from the group consisting of an C_1–C_4 alkyl group and a halogen atom said process comprising the steps of:

(a) partially hydrogenating a benzene compound selected from the group consisting of benzene and derivatives thereof substituted with at least one substituent selected from the group consisting of C_1–C_4 alkyl groups and halogen atoms, followed by separating the reaction mixture into the respective components of the resultant cyclohexene and cyclohexane compounds and the unreacted benzene compound;

(b) oxidizing or hydrating the separated cyclohexene compound into the corresponding oxygen-containing compound selected from eh group consisting of the corresponding cyclohexanone compound, cyclohexenone compound, cyclohexanol compound and cyclohexenol compound;

(c) dehydrogenating the oxygen-containing compound into the corresponding phenol compound;

(d) dehydrogenating the cyclohexane compound separated in step (a) to form the benzene compound;

(e) returning at least a part of hydrogen formed in dehydrogenation steps (c) and (d) to step (a).

5,180,872

PROCESS FOR THE PREPARATION OF STYRENE DERIVATIVES EXTENDED AT THE DOUBLE BOND BY ETHYLENE AND HAVING A DOUBLE BOND REMAINING IN THE EXTENSION CHAIN FORMED AND NEW STYRENE DERIVATIVES EXTENDED WITH ETHYLENE

Karl-Heinz A. O. Starzewski, Bad Vilbel, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

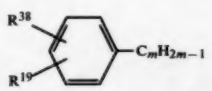
Filed May 23, 1991, Ser. No. 704,751

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1990, 4018068

Int. Cl.[5] C07C *2/02, 2/46, 2/64, 2/66*

U.S. Cl. 585—435 **11 Claims**

1. A process for the preparation of styrene derivatives extended at the double bond with ethylene and having a double bond remaining in the extension chain formed, according to the formula



in which

R^{19} denotes hydrogen, C_1–C_4-alkylvinyl or chlorine,

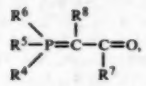
R^{38} denotes C_1–C_4-alkyl, C_2–C_4-alkenyl, C_2–C_7-acyl, fluorine chlorine or bromine, and

m has a value of 4 to 104,

with the exception of compounds wherein R^{19} is hydrogen and R^{38} is isobutyl or benzyl and m has the value 4,

wherein a styrene derivative is reacted with ethylene in the presence of a nickel catalyst which carries a phosphorus-oxygen chelate ligand, at a temperature of 20to 160° C. and an

ethylene pressure of 1 to 200 bar, wherein the nickel catalyst is obtained by reaction of a nickel (O) compound, or a compound which can be converted in situ to a nickel (O) compound, with a phosphorus compound of the formula



(I)

in which

R^4, R^5, R^6, R^7 and R^8 independently of one another denote straight-chain or branched C_1–C_{20}-alkyl, C_2–C_{20}-alkenyl, C_1–C_{20}-alkoxy, C_3–C_8-cycloalkyl, C_6–C_{12}-aryl, C_6–C_{12}-aryloxy, C_7–C_{15}-aralkyl or C_7–C_{15}-aralkoxy, where

R^7 can additionally denote hydrogen and

R^8 can additionally denote hydrogen, acyl or sulphonate, or a nickel catalyst which can be prepared by reaction of a nickel (O) compound, or a compound which can be converted in situ to a nickel (O) compound, with an adduct of a quinoid compound or maleic anhydride and a phosphine of the formula

(II)

in which

R^4, R^5 and R^6 have the meaning mentioned.

5,180,873

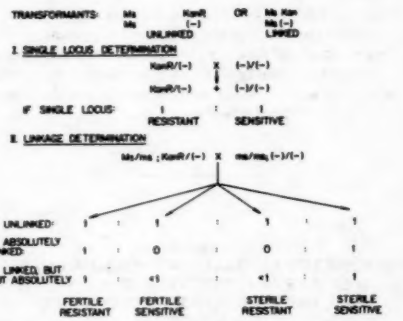
TRANSFORMATION OF PLANTS TO INTRODUCE CLOSELY LINKED MARKERS

Richard A. Jorgensen, Berkeley, Calif., assignor to DNA Plant Technology Corporation, Oakland, Calif.

Filed Apr. 16, 1985, Ser. No. 723,857

Int. Cl.[5] **A01H** *1/04, 1/00;* **C12N** *15/00, 9/00;* **C12P** *21/00*

U.S. Cl. 800—205 **39 Claims**



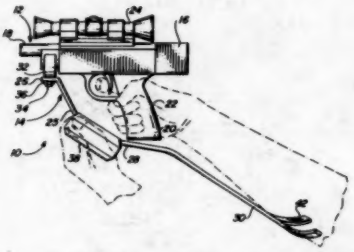
39. A close-linkage, dicotyledenous maintainer plant heterozygous for male fertility, said maintainer plant comprising a dominant marker foreign to the species of said maintainer plant closely linked in coupling to a male sterile locus at a linkage of less than about 10 recombination units.

5,180,874

HANDGUN BRACE AND ASSEMBLY

Fernando Troncoso, Jr, 14090-6100 Rd., Montrose, Colorado, Colo.

Filed Aug. 29, 1991, Ser. No. 751,551
Int. Cl.[5] F41C *23/12*
U.S. Cl. 042—72 4 Claims



1. An improved handgun brace adapted to be releasably held against a handgun having a butt, body and barrel, said brace comprising, in combination:

a) an elongated rod having an upraised front portion, an intermediate portion connected to said front portion and sloping downwardly and rearwardly therefrom, and a rear portion connected to said intermediate portion and extending downwardly and rearwardly from said intermediate portion;

b) an upraised fork connected to said front portion and adapted to releasably support the barrel of said handgun, said fork being stepped to accommodate handgun barrels of various diameters;

c) said intermediate portion being adapted to support the butt of said handgun; and

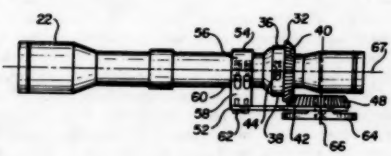
d) means connected to said rear portion and adapted to brace said rod only against a handgun shooter's shooting forearm.

5,180,875

SCOPE ADJUSTMENT FOR FIREARMS

Waldo A. Berry, Jr., R.D. 1, Box 259, Carmichaels, Pa. 15320, and Edward M. Klara, P.O. Box 323, Grant Town, W. Va. 26574

Filed Jun. 20, 1990, Ser. No. 540,904
Int. Cl.[5] F41G *1/38*
U.S. Cl. 42—101 28 Claims



1. A variable magnification power scope comprising:

a tubular body having an eyepiece end and a rangefinder end;

at least one lens within the tubular body;

a zoom ring mounted on the tubular body for varying the magnification power of the scope; and

adjustment means for manipulating the zoom ring, said adjustment means comprising:

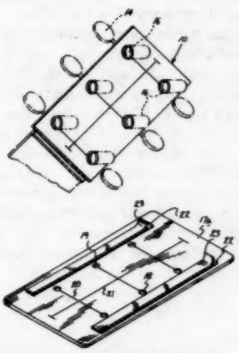
a first gear concentrically mounted on the zoom ring for rotation therewith, a zoom ring clamp concentrically mounted on the zoom ring and carrying said first gear, each of said zoom ring clamp and said first gear including a first portion and a second portion which are adapted for attachment to one another to encircle the zoom ring, a second gear carried on the tubular body and engageable with the first gear, a concentric shaft depending from the second gear, and means for rotating the shaft and the second gear on a first axis, thereby rotating the first gear and the zoom ring on a second axis and varying the magnification power of the scope.

5,180,876

STRING INSTRUMENT TUNING GUARD

Nora J. Thorward, 1125 Loma Ave. #157, Coronado, Calif. 92118

Filed Jun. 13, 1991, Ser. No. 714,560
Int. Cl.[5] G10D *1/12*
U.S. Cl. 84—293 3 Claims



1. A string instrument tuning guard in combination with a string instrument member, wherein the string instrument member includes an instrument neck mounted to an instrument body, wherein the instrument neck extends exteriorly of the instrument body and terminates in an instrument tuner head, the tuner head includes a plurality of individual adjusting members rotatably mounted to the tuner head, with each of said adjusting members including an adjusting rod projecting from a top surface of the tuner head to provide a plurality of adjusting rods, each of said adjusting rods including a flexible string member wound thereabout for effecting musical tuning of each string member, wherein the guard apparatus includes,

a flexible support plate, the flexible support plate includes at least a first row of equally spaced apertures, the apertures each receiving one of said adjusting rods therethrough for securement of the flexible support plate relative to the tuner head, and

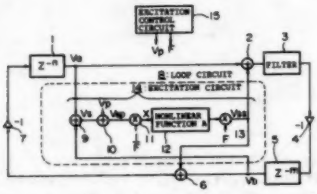
a second row of second apertures arranged parallel relative to the first row of apertures, and each of said apertures of the first row of apertures is aligned with a respective second aperture, with a connecting slit directed therebetween in a diametrically aligned relationship, and each connecting slit is arranged in a parallel relationship, and including a medial slit orthogonally bisecting the connecting slit to permit flexure of the support plate and apertures in receiving the adjusting rods therethrough.

5,180,877

MUSICAL TONE SYNTHESIZING APPARATUS USING WAVE GUIDE SYNTHESIS

Toshifumi Kunimoto, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jul. 26, 1990, Ser. No. 558,059
Claims priority, application Japan, Jul. 27, 1989, 1-194580
Int. Cl.[5] G10H *1/14, 5/00*
U.S. Cl. 84—624 16 Claims



1. A musical tone synthesizing apparatus comprising:

(a) closed-loop means functioning as a closed loop circuit and including delay means having a delay interval corresponding to a pitch of a musical tone to be synthesized, wherein a signal is circulated in the closed loop circuit to create a standing wave and the circulating signal is picked up from the closed loop circuit as a musical tone signal;

(b) control signal means for generating a first control signal and a second control signal;

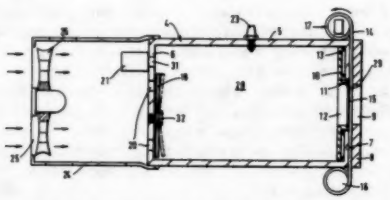
(c) excitation means outside of the closed loop circuit for creating excitation signal, including means for providing a signal having a value corresponding to an output of the closed loop circuit and the first control signal and converting the provided signal in accordance with a conversion characteristic having a linear range and a non-linear range, the excitation means including means for expanding or contracting the linear range in response to the second control signal, the excitation means supplying the created excitation signal into the closed-loop means to affect signal circulating in the closed loop circuit.

5,180,878

GUNFIRE SIMULATOR

Clifford Denchfield, Ellington, England, assignor to Loral Europe Limited, Enfield, Great Britain

Filed Mar. 3, 1992, Ser. No. 845,181
Int. Cl.[5] F41A *33/00*
U.S. Cl. 89—7 15 Claims



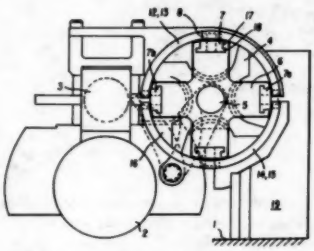
1. A gunfire simulator comprising a combustion chamber, means for admitting fuel gas to the combustion chamber, a flap valve for admitting air to the combustion chamber, means to force ambient air into the combustion chamber through the flap valve, ignition means for igniting fuel gas in the combustion chamber, an exhaust port in the combustion chamber, and outlet valve means for closing the exhaust port and arranged to open rapidly in response to a pressure rise within the combustion chamber.

5,180,879

AMMUNITION SUPPLY DEVICE FOR AN AUTOMATIC WEAPON

Georges H. Simon, Saint Germain du Puy; Patrice J. Pichot, and Alain J. M. Boissau, both of Bourges, all of France, assignors to Giat Industries, France

Filed Oct. 21, 1991, Ser. No. 779,833
Claims priority, application France, Jul. 12, 1990, 90 08872
Int. Cl.[5] F41A *9/20*
U.S. Cl. 89—33.17 5 Claims



1. A device for feeding ammunition from a stationary magazine to an automatic weapon, comprising:

a barrel mounted on a rotatable shaft having a longitudinal axis;

at least one slide longitudinally slidably supported by said barrel, said at least one slide having gripping means for carrying a round of ammunition to a breech of said weapon from a predetermined position;

an ammunition supply device mounted on said rotatable shaft to supply ammunition from said magazine to said predetermined position;

a roller fixed to said at least one slide;

primary guide means for positioning said at least one slide at a predetermined longitudinal position with respect to said weapon from a random longitudinal position with respect to said weapon, said primary guide means comprising a first ramp and a first counter ramp fixed to a recoiling part of the weapon, a distance between said first ramp and said first counter ramp decreasing towards said breech of said weapon to a length approximately equal to a diameter of said roller, said roller cooperable with said ramp and counter ramp to guide said at least one slide towards said breech;

secondary guide means for positioning said at least one slide at a predetermined longitudinal position with respect to said magazine from a random longitudinal position with respect to said magazine, said secondary guide means comprising a second ramp and a second counter ramp fixed to said magazine, a distance between said second ramp and said second counter ramp decreasing towards said magazine to a length approximately equal to a diameter of said roller, said roller cooperable with said second ramp and said second counter ramp to guide said at least one slide towards said magazine.

5,180,880

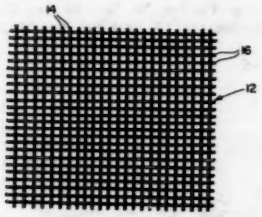
SOFT BODY ARMOR

T. Tyler Zufle, Square One, Lafayette at the River, Gretna, La. 70053-5835

Filed Feb. 28, 1990, Ser. No. 486,387
Int. Cl.[5] F41H *5/12*
U.S. Cl. 89—36.02 6 Claims

1. A soft body armor comprising multiple independent plies of ballistic material, said plies being constructed of dissimilar material, each ply of said ballistic material being woven with independent warp yarns having a low modulus of elasticity and independent fill yarn having a high modulus of elasticity, said

warp yarn being constructed of aramid fiber, said fill yarn being constructed of thermoplastic material, said aramid fiber



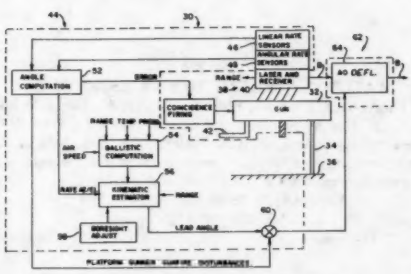
including a hard surface and high tensile strength to dissipate energy of a ballistic projectile trying to penetrate the armor.

5,180,881

BEAM STEERED LASER FOR FIRE CONTROL

John R. Wootton, and Gary Waldman, both of St. Louis, Mo., assignors to Electronics & Space Corp., St. Louis, Mo.

Filed Jun. 12, 1991, Ser. No. 713,877
Int. Cl.[5] F41G *3/16, 3/06*
U.S. Cl. 89—41.19 **19 Claims**



1. Fire control apparatus for locating a target at which a projectile is to be fired from a gun, determining the range between said gun and said target, and for thereafter designating said target so a projectile fired by said gun strikes said target comprising:

a gun for firing a projectile at a target, said gun being manually movable by a gunner;

a platform on which said gun is mounted, said platform being subject to vibratory motion;

laser means for generating a laser beam directable at said target, said laser means comprising a multi-mode laser operable in both a pulsed mode and in a continuous-wave (CW) mode, said pulsed mode being used for determining said target's range and said continuous-wave mode when said laser beam is designating said target;

targeting means operable by said gunner for directing said laser beam at said target and for receiving a return laser waveform reflected by said target back toward said platform;

processing means responsive to said return waveform to determine said target's range and direction of movement relative to an axis of said platform, and for determining a firing solution by which said projectile fired from said gun strikes said target, said solution including a lead angle by which said gun should be directed ahead of said target for said projectile to strike said target; and,

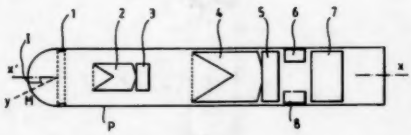
beam steering means responsive to said processing means for realigning said laser beam relative to said target in a accordance with said firing solution whereby said projectile fired from said gun strikes said target, said beam steering means stabilizing said laser beam to isolate said laser beam from platform vibrations and enhance system accuracy.

5,180,882

SYSTEM OF FIRING CONTROL WITH PROGRAMMABLE DELAYS FOR PROJECTILE HAVING AT LEAST ONE WARHEAD

Joël Bansard, Marcilly en Vilette/la Ferte St. Aubin, France, assignor to Thomson-Brandt Armements, Boulogne-Billancourt, France

Filed Apr. 12, 1991, Ser. No. 684,252
Claims priority, application France, Apr. 27, 1990, 90 05399
Int. Cl.[5] F42C *1/00*
U.S. Cl. 102—216 **11 Claims**



1. A firing control system with programmable delays for a projectile having at least one warhead, comprising:

first determining means for determining an instant of impact T_o of said projectile on a target;

second determining means for determining an angle of incidence I of said projectile on the target at the instant of impact;

third determining means for determining a speed V of said projectile at the instant of impact;

fourth determining means for determining information C characteristic of the type of target;

processing means for receiving information from said first, second, third and fourth determining means and making a determination, on the basis of the information from the first, second, third and fourth determining means, of an optimum delay for activating the firing of the at least one warhead after impact; and

command means for commanding firing of the at least one warhead under control of the processing means.

5,180,883

AMMUNITION

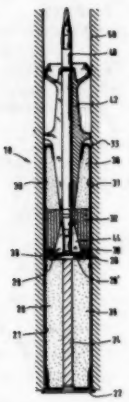
Heinz Jaskolka, Velbert; Eckhard Rahnenführer, Dormagen, and Albert Schulze, Mönchengladbach, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 18, 1991, Ser. No. 809,128
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1990, 4041611
Int. Cl.[5] F42B *5/02, 5/36*
U.S. Cl. 102—443 **14 Claims**

1. An ammunition round comprising a projectile, two separate charges to be aligned one behind the other including a forward projectile charge, with a rear end of said projectile extending far into said forward charge, and a rear primary charge, and first and second annular transfer charges disposed respectively adjacent a front end of said primary charge and a rear end of said projectile charge in the region of a respective outer circumference of said projectile charge and of said primary charge, and wherein:

said forward projectile charge includes a charge casing containing a propellant charge and including a generally cylindrical member which is closed at its rear end by a bottom member and which has a cover with a central opening, through which the projectile extends into the charge casing, at its front end; said rear primary charge includes a charge casing containing a propellant charge and including a generally cylindrical member which is

closed at its rear end by a bottom member and its front end by a cover; and said charge casing of said forward projec-



tile charge and at least said cylindrical member and said cover of said charge casing of said rear primary charge are formed of a combustible material.

5,180,884

SHIELDED WIRE AND CABLE

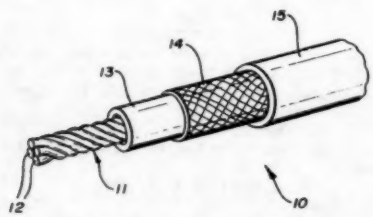
Mahmoud Aldissi, Colchester, Vt., assignor to Champlain Cable Corporation, Winooski, Vt.

Division of Ser. No. 691,571, Apr. 25, 1991, Pat. No. 5,103,067, which is a continuation-in-part of Ser. No. 656,658, Feb. 19, 1991, abandoned. This application Nov. 18, 1991, Ser. No. 794,101

The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.

Int. Cl.[5] H01B *7/34*

U.S. Cl. 174—36 **15 Claims**



1. A cable article having shielding against EMI and RFI, comprising:

a conductive core member;

at least one layer of insulation disposed over said conductive core member;

a layer of shield material consisting of metallic coated aramid fibers that are served into a mesh to provide a protective shield layer disposed over the insulated conductive core member, said served mesh forming a shield layer that exceeds 96% coverage of said at least one layer of insulation and providing shielding effectiveness of at least approximately between 10^1 and 10^{-3} ohms/meter of impedance across a frequency range of between 100 KHz and 1 GHz; and

a jacket disposed over said protective shield layer comprising at least one layer of material.

5,180,885

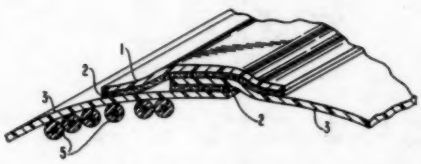
ELECTROSTATIC CHARGE DISSIPATING ELECTRICAL WIRE ASSEMBLY AND PROCESS FOR USING SAME

Dinesh Shah, 2146 W. Knox Rd., Chandler, Ariz. 85224

Continuation-in-part of Ser. No. 508,885, Apr. 12, 1990. This application Jun. 17, 1991, Ser. No. 716,576

Int. Cl.[5] H01B *7/34*

U.S. Cl. 174—36 **8 Claims**



1. An assembly of electrical wires having a removable flexible protective jacket wrapped around said assembly of wires, said jacket comprising a sheet of polyether based polyurethane containing a conductive filler material which dissipates an electrostatic charge.

5,180,886

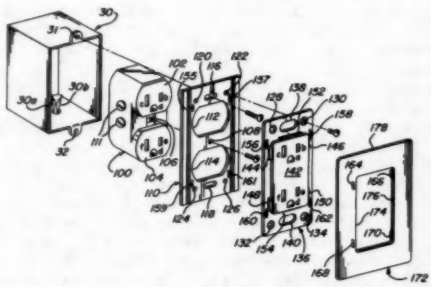
WALLBOX ELECTRIC DEVICE ASSEMBLY

Karl Dierenbach, Perkasie; Elliot G. Jacoby, Jr., Glenside, both of Pa.; Dan A. Snavely, Johnson City, N.Y.; Darryl W. Tucker, Royersford; Scott N. Walck, Allentown, both of Pa., and Scott N. Walck, Allentown, both of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Aug. 9, 1989, Ser. No. 391,759

Int. Cl.[5] H02G *3/14*

U.S. Cl. 174—66 **22 Claims**



1. A wallbox mountable electric device comprising, in combination:

a) an electric socket for receiving a plug,

b) means for supporting said socket, and

c) a plurality of decorative components uninterrupted by visible attachment means and attachable to said support means, at least one said component substantially covering said socket and each component being individually removable and replaceable by any one of a plurality of similarly configured components having a variety of colors and textures, said components being removable and replaceable without being impeded by or supported from said socket.

5,180,887

ELECTRIC SUPPLY RAMP WITH SUPPORT PROFILE

Branka Agabekov, 73, route de Thonon, Vesenaz, Switzerland

Continuation-in-part of Ser. No. 452,121, Dec. 15, 1989, Pat. No. 5,038,257. This application Jun. 6, 1991, Ser. No. 711,658

Claims priority, application Switzerland, Dec. 20, 1988, 4705/88 9

Int. Cl.[5] F21V *21/00*; H01B *5/00*; H01R *25/16*

U.S. Cl. 174—72 B 19 Claims

1. An electrifiable ramp having an succession of pairs of electric contacts, the ramp comprising:

a bottom conductive strip;

a top conductive strip superimposed above said bottom strip;

insulating means disposed between the top and bottom conductive strips for preventing electric contact therebetween;

respective plates cut out along a lengthwise direction of each of said bottom and top conductive strips, each plate on both strips having a free end folded upwardly in the same direction form the respective strip and extending out of the plane of the strip in a first direction, wherein the plates of the top conducive strip extend above the top conductive strip and the plates of the bottom conductive strip also extend above the top conductive strip;

means disposed on the free end of each of the plates for positioning an electric contact of a current consuming element and

a profile including conductive strip holding means for receiving the top and bottom superimposed conductive strips, whereby the strips may be supported by the profile for application with the profile to a selected installation.

5,180,888

CONDUCTIVE BONDING AGENT AND A CONDUCTIVE CONNECTING METHOD

Kazuhiro Sugiyama, and Yoshinori Atsumi, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

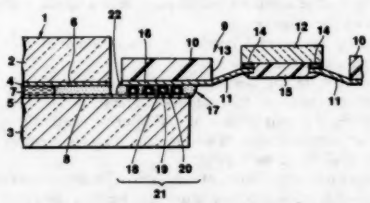
Continuation-in-part of Ser. No. 602,715, Oct. 24, 1990, which is a continuation-in-part of Ser. No. 432,135, Nov. 6, 1989. This application Jun. 12, 1991, Ser. No. 713,822

Claims priority, application Japan, Aug. 10, 1989, 1-205736; Aug. 10, 1989, 1-205737; Aug. 15, 1989, 1-209638; Aug. 15, 1989, 1-209639; Jan. 19, 1990, 2-9780; Feb. 27, 1990, 2-44319; Oct. 11, 1990, 2-270453

The portion of the term of this patent subsequent to Mar. 12, 2008, has been disclaimed.

Int. Cl.[5] H01R *3/00*

U.S. Cl. 174—94 R 14 Claims



1. A conductive connecting structure comprising:

an electronic part module including

a first substrate,

a plurality of first connecting terminals formed on said first substrate,

an electronic part mounted on said first substrate and having a plurality of electrodes, and

means for electrically connecting said electrodes of said electronic part to said first connecting terminals;

a second substrate having a plurality of second connecting terminals each of which corresponds with one of said first connecting terminals; and

a conductive bonding agent interposed between said first substrate of said electronic part module and said second substrate for electrically connecting each of said first connecting terminals to a corresponding one of said second connecting terminals, said conductive bonding agent including:

an insulating adhesive, and a plurality of fine connecting particles, each fine connecting particles comprising:

an insulating fine particle,

an electrically conductive layer formed on said insulating fine particle, and

an insulating layer covering said electrically conductive layer while exposing said electrically conductive layer at least at portions contacting with one of said first connecting terminals and said second connecting terminals.

5,180,889

CRUSH RESISTANT CABLE INSULATION

Charles E. Rogers, Somerville, and Gertraud A. Schmidt, Red Bank, both of N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 13, 1990, Ser. No. 627,192

Int. Cl.[5] H01B *7/18*

U.S. Cl. 174—113 R 6 Claims

1. A cable construction having a flatwise crush resistance of at least 600 pounds and an edgewise crush resistance of at least 1200 pounds comprising:

(a) an assembly of three parallel electrical conductors, two of the conductors being coated with the following non-crosslinked composition:

(i) a copolymer comprising ethylene and one or more alpha-olefins having 3 to 8 carbon atoms, said copolymer having a density in the range of 0.870 to 0.915 gram per cubic centimeter and, based upon 100 parts by weight of component (i):

(ii) a surface treated metal hydrate flame retardant compound in an amount of about 200 to about 400 parts by weight;

(iii) a styrene-ethylene-butylene-styrene triblock copolymer in an amount of about 25 to about 100 parts by weight;

(iv) an impact polypropylene copolymer in an amount of about 25 to about 100 parts by weight; and

(v) an organosilane coupling agent in an amount of about 0.5 to about 5 parts by weight;

(b) one or more layers of paper surrounding component (a);

(c) one or more layers of paper inside of component (b) and surrounding the conductor, which is not coated; and

(d) a layer of said non-crosslinked composition surrounding component (b).

5,180,890

COMMUNICATIONS TRANSMISSION CABLE

Paul J. Pendergrass, Hudson, and Edmund Allcock, North Attleboro, both of Mass., assignors to Independent Cable, Inc., Hudson, Mass.

Filed Mar. 3, 1991, Ser. No. 665,562

Int. Cl.[5] H01B *7/08*

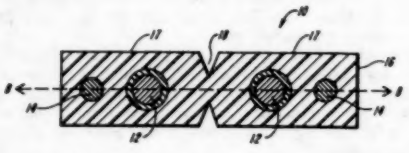
U.S. Cl. 174—117 F 16 Claims

1. A communications transmission cable comprising

a jacket having

at least two jacket encased portions, each joined to at least one adjacent, jacket encased portion at a recessed section;

wherein



each jacket encased portion includes at least one conductor spaced apart from and approximately parallel to at least one strength member;

whereby

the jacket encased portions are readily separable at each recessed section.

5,180,891

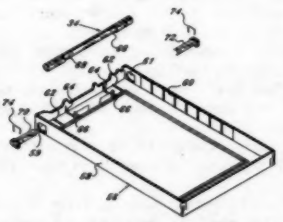
DIGITIZER TABLET WITH INTERNALLY STORED WIRELESS STYLUS

Brian A. Trumbo, Boynton Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 17, 1991, Ser. No. 778,542

Int. Cl.[5] G08C *21/00*

U.S. Cl. 178—18 **18 Claims**



1. A digitizer tablet and wireless stylus comprising:

said stylus having an elongated cylindrical body and a pocket clip attached to said body adjacent one end of said body;

said tablet including a housing having an elongated storage compartment therein which is accessible through an opening in said housing, said compartment being of a length sufficient to substantially completely store said stylus lengthwise within said storage compartment while exposing a portion of said stylus through said opening;

and a push-push latch mechanism comprising a keeper mounted in said storage compartment and a latch on said stylus, said mechanism being operable in response to pushing said stylus through said opening into said storage compartment to move said latch into engagement with said keeper to retain said stylus in said storage compartment, said mechanism being further operable in response to pushing said stylus while it is retained in said compartment to release said latch from said keeper and move said stylus outwardly from said storage compartment.

5,180,892

ACCELERATION SENSOR WITH MAGNETICALLY INFLUENCED ROTARY MEMBER

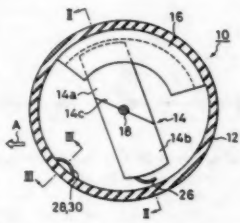
Kazuo Yoshimura, and Satoh Ryo, both of Kanagawa, Japan, assignors to Takata Corporation, Tokyo, Japan

Filed Dec. 3, 1991, Ser. No. 801,870

Claims priority, application Japan, Dec. 25, 1990, 2-405801

Int. Cl.[5] H01H *35/14*

U.S. Cl. 200—61.45 M **14 Claims**



1. An acceleration sensor comprising:

a rotary member including a rotary shaft, said rotary member being rotatable about the rotary shaft and having a gravity center positioned outwardly of said rotary shaft and a conductive member constituting at least a part of the rotary member other than said rotary shaft;

a magnet situated at a side opposite to said conductive member so that when the rotary member rotates upon detection of an acceleration, current is induced in the conductive member by means of the magnet, which impedes the rotation of said rotary member; and

rotation detecting means for detecting a predetermined rotational angle of said rotary member so that when an acceleration larger than a predetermined value is applied to the acceleration sensor, the detecting means operates.

5,180,893

METHOD OF HEATING THERMOPLASTIC BOTTLE OR PREFORM AND METHOD OF CONTROLLING TEMPERATURE OF HEATING MEMBER UTILIZED BY THE HEATING METHOD

Ikuo Sugiyama, Kanagawa; Kazuhisa Ishibashi, Tokyo; Nobuyuki Takakusaki, Kanagawa; Yoshitsugu Maruhashi, Kanagawa; Yasushi Nishimura, Kanagawa; Hiroshi Koyama, Tokyo; Setsuko Iida, and Koji Sato, both of Kanagawa, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Continuation of Ser. No. 339,790, Feb. 7, 1990, Pat. No. 5,032,700. This application Nov. 2, 1990, Ser. No. 608,420

Claims priority, application Japan, Jun. 9, 1987, 62-142299; Nov. 5, 1987, 62-278239; Jan. 19, 1988, 63-7416; Jun. 8, 1988, PCT/JP88/00553

The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.

Int. Cl.[5] H05B *6/10*

U.S. Cl. 219—10.43 **26 Claims**

1. A method of heating a mouth portion of a plastic preform, comprising the steps of:

providing an internal heating member which is movable along a circulating path;

providing external heating means at an external heating station fixed along said circulating path;

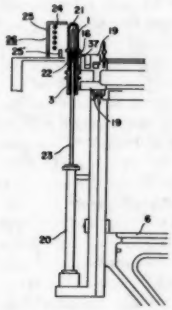
measuring the temperature of said internal heating member prior to the insertion of said internal heating member into said preform to be heated;

adjusting the temperature of said internal heating member to a predetermined temperature by heating said internal heating member in accordance with any difference between said measured temperature and said predetermined temperature;

inserting said internal heating member, which has been

heated to said predetermined temperature, into said preform to be heated;

circulating said internal heating member, having said preform disposed thereon, past said external heating means such that said preform is simultaneously heated both ex-



ternally and internally by said external heating means and said internal heating member;

removing said heated preform from said internal heating member; and

recirculating said internal heating member along said circulating path.

5,180,894

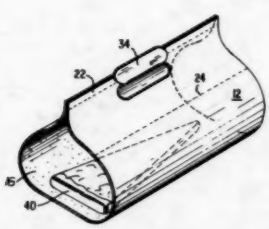
TUBE FROM MICROWAVE SUSCEPTOR PACKAGE

James R. Quick, Greenwood Lake, N.Y.; James L. Alexander, Memphis, Tenn.; Christopher C. Lai, Battlecreek, Mich.; Susan A. Matthews, Mobile, Ala., and Donna J. Wenzel, Middletown, N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Jun. 19, 1990, Ser. No. 540,069

Int. Cl.[5] H05B *6/80*

U.S. Cl. 219—10.55 E **8 Claims**



1. A tube type microwave cooking container formed from a flat rectangular paper blank including a layer of microwave susceptor material, said layer of microwave susceptor material having the property of converting microwave energy to thermal energy, the area on said flat rectangular paper blank covered by said layer of microwave susceptor material being of a generally rectangular shape, the length of said generally rectangular shape being equal to the length of said flat rectangular paper blank, the width of said generally rectangular shape being less than the width of said flat rectangular paper blank, whereby two parallel bands extend along the length of said flat rectangular paper blank and are devoid of said microwave susceptor material, two longitudinally extending bands of said flat rectangular paper blank joined together in surface to surface, facing contact along the length of said flat rectangular paper blank to thereby form said tube type microwave cooking container having both ends open, each of said two longitudinally extending bands being coextensive with at least a portion of the width of one of said two parallel bands, said tube type microwave cooking container having an interior surface, said two longitudinally extending bands joined together with facing surfaces corresponding to the same surface of said flat rectangular paper as said interior surface of said tube type microwave cooking container, said tube type microwave cooking container being collapsible to a flattened form of uniform thickness equal to two thicknesses of said flat rectangular paper blank.

5,180,895

MICROWAVE HEATING APPARATUS

David H. Briggs, Silchester, and Richard F. Freeman, Linton, both of Great Britain, assignors to Unilever Patent Holdings B.V., Netherlands

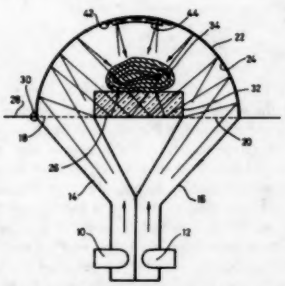
PCT No. PCT/GB89/01149, § 371 Date May 22, 1991, § 102(e) Date May 22, 1991, PCT Pub. No. WO90/03715, PCT Pub. Date Apr. 5, 1990

PCT Filed Sep. 28, 1989, Ser. No. 671,831

Claims priority, application United Kingdom, Sep. 28, 1988, 8822708

Int. Cl.[5] H05B *6/72*

U.S. Cl. 219—10.55 F **9 Claims**



1. Microwave heating apparatus comprising a heating chamber in which a foodstuff is to be heated using microwave energy; a circular reflecting surface mounted in the chamber by which microwave energy is focussed onto the foodstuff; two independent microwave sources for supplying microwave energy to the chamber so as to result in a more uniform heating-through of the foodstuff; a waveguide connected to each said source for directing microwave energy to the chamber, the cross-sections of the waveguides increasing from relatively small cross-sections to at least two outlets which cooperate together to describe a complete annulus whose outer diameter corresponds to the diameter of said reflecting surface and whose inner diameter corresponds to the diameter of said circular platform; a browning aid located within the chamber; and means for shielding the browning aid from microwave energy until a particular part of the heating cycle has been reached so as largely to prevent microwave energy from being incident on the browning aid until an appropriate time in the heating cycle.

5,180,896

SYSTEM AND METHOD FOR IN-LINE HEATING OF MEDICAL FLUID

Gordon L. Gibby; Samsun Lampotang, both of Gainesville, Fla.; Daraius Hathiram, Houston, Tex., and Nikolaus Gravenstein, Gainesville, Fla., assignors to University of Florida, Gainsville, Fla.

Filed Oct. 11, 1990, Ser. No. 595,472

Int. Cl.[5] H05B *6/64*

U.S. Cl. 219—10.55 A **3 Claims**

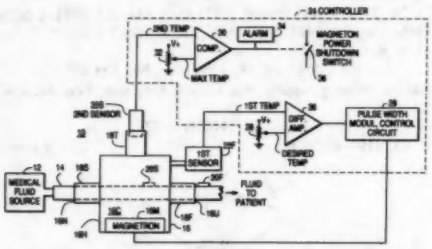
1. A system for in-line heating of medical fluids supplied to a patient comprising:

a heating apparatus for radiant heating by electromagnetic radiation including a source of electromagnetic radiation,

a housing and a zone for heating within said housing, said housing having an inlet for entry of medical fluids into said zone while said source is generating electromagnetic radiation and an outlet for exit for medical fluids while said source is generating electromagnetic radiation for heating medical fluids flowing in a path between said inlet and outlet;

a first sensor for sensing the temperature at a first location of medical fluid heated by said heating apparatus and generating a first output representative of sensed temperature, said first sensor sensing temperature by receiving optical waves of energy;

a controller for receiving said first output and providing



feedback control of said source to minimize differences between the sensed temperature of the medical fluid and a desired temperature for the medical fluid; and

a tube for carrying medical fluid therein at least in said zone between said inlet and said outlet and defining said path, said first sensor sensing temperature by nonconductively sensing infrared energy from the medical fluid, at least some of which has passed through at least part of said tube, from at least one of said tube and the medical fluid at said first location for sensing temperature of medical fluid within said tube, said first location being within said tube, said first sensor being separate from said tube, and said tube including a thin membrane portion to allow infrared energy to pass therethrough to said first sensor.

5,180,897

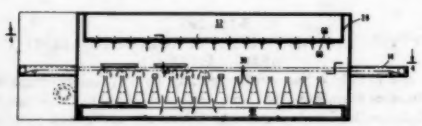
Patent Not Issued For This Number

5,180,898

HIGH VELOCITY CONVEYOR OVEN

Lorne B. Alden, Shelburne; James T. Cole, Essex Junction; James E. Lockridge, and Thomas E. Costello, both of Burlington, all of Vt., assignors to G. S. Blodgett Corporation, Burlington, Vt.

Filed Jul. 25, 1991, Ser. No. 735,729
Int. Cl.[5] F27B *9/10*
U.S. Cl. 219—388 **15 Claims**



1. A versatile conveyor oven effective to produce a variety of different cooking conditions comprising:

an elongated hollow cabinet defining a cooking chamber having an inlet port at one end and an outlet port at an opposite end;

an open mesh conveyor extending through the cabinet from outside the inlet to outside the outlet and means for moving said conveyor relative to said cabinet along a path of travel in a predetermined direction through the cooking chamber so that product to be cooked placed on the conveyor at the inlet will travel on the conveyor through the cooking chamber to the outlet;

layered plate means disposed within the cooking chamber above said conveyor and extending substantially from the inlet to the outlet for dispensing heated convection air currents downwardly upon the conveyor including a lower plate having a plurality of mutually spaced slots extending perpendicular to the path of travel of said conveyor, and the length of said lower plate, each slot having forward and rear, depending flanges spaced on either side thereof depending downwardly substantially perpendicular to the path of travel of said conveyor, an upper plate mounted on said lower plate and having a plurality of mutually spaced ports extending laterally and longitudinally the width and length of said upper plate, registering on the slots in said lower plate for restricting the flow of convection currents through said slots whereby currents passing through the ports and slots expand laterally along the flanges but are directed downwardly thereby;

nozzle means disposed within the cooking chamber below said conveyor and extending substantially from the inlet to the outlet for dispensing mutually spaced discrete jets of heated air upwardly onto the lower surface of said conveyor along the length thereof, each jet extending laterally across the width of said conveyor;

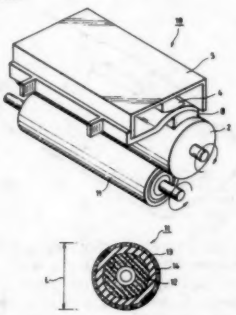
heating means and blower means coupled thereto for supplying heated air to said plate means and nozzle means.

5,180,899

FIXING UNIT FOR PICTURE IMAGE FORMING EQUIPMENT HAVING A THREE LAYERED FIXING ROLLER

Yutaka Inasaki, Saitama, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1990, Ser. No. 603,009
Claims priority, application Japan, Nov. 8, 1989, 1-130190
Int. Cl.[5] G03G *15/20*
U.S. Cl. 219—469 **3 Claims**



1. A fixing unit for picture image forming equipment, comprising:

a heating roller;

a pressure roller contacting said heating roller along a pressure line, said pressure roller having at least three layers including an innermost silicone sponge layer, an intermediate silicone rubber layer and an outer polytetrafluoroethylene layer;

means for creating pressure between the rollers along the pressure line,

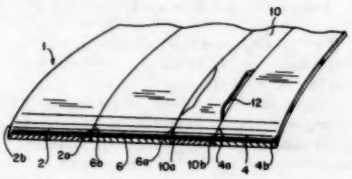
wherein said innermost silicone sponge layer has a thickness in the range of 50 to 60 percent of the outside diameter of the pressure roller.

5,180,900

ELECTRICAL RESISTANCE ELEMENT WITH HEAT-SENSITIVE DISCONNECT CAPABILITY

Walter C. Lovell, Wilbraham, Mass., assignor to Tapeswitch Corporation of America, Farmingdale, N.Y.

Filed Apr. 15, 1991, Ser. No. 685,827
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—517 **15 Claims**



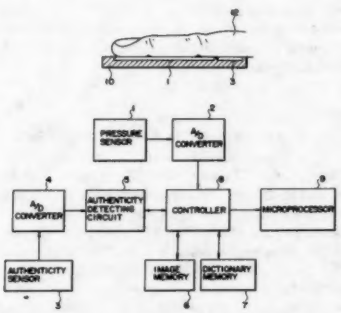
1. An electrical resistance heating element, which comprises:
a pair of spaced apart electrical conductors;
a strip of resistive material disposed between the conductors and extending along the lengths thereof; and
a strip of heat-sensitive, electrically conductive material disposed between the conductors and extending along the lengths thereof;
the strips of resistive material and heat-sensitive, electrically conductive material together providing an electrical path transversely between the conductors along the lengths thereof, the heat-sensitive strip permanently interrupting an electrical path between the conductors only over portions of the resistance heating element which attain a predetermined temperature.

5,180,901

IC CARD WITH INDIVIDUAL AUTHENTICATION FUNCTION

Kenichi Hiramatsu, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 5, 1991, Ser. No. 680,899
Claims priority, application Japan, May 21, 1990, 2-130897
Int. Cl.[5] G06K *5/00, 19/06*
U.S. Cl. 235—380 **16 Claims**



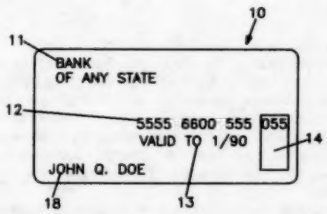
1. An IC card with an individual authentication function, comprising:
an IC card main body;
memory means for storing reference finger characteristic data of a card owner;
pressure sensing means, provided on one surface of the IC card main body, for measuring an applied finger pressure as measured finger characteristic data;
collating means for collating the measured finger characteristic data with the reference finger characteristic data; and
control means for permitting use of the IC card on the basis of a collation result of the collating means.

5,180,902

SELF VERIFYING TRANSACTION CARD WITH DISABLING CAPABILITY

David Schick, 150-54 76th Rd., and Mark Bane, 141-17 72nd Crescent, both of, Flushing, N.Y. 11367

Continuation-in-part of Ser. No. 184,251, Apr. 21, 1988, abandoned. This application May 17, 1991, Ser. No. 701,794
Int. Cl.[5] G06K *5/00*
U.S. Cl. 235—380 **6 Claims**



1. A self verifying transaction card having a keyboard for entering a personal identification code, a non-volatile memory with a stored code, a self contained non-replaceable power supply sealed within said card, clock/calendar means for determining real time and a timer for measuring elapsed time from activation of the card, a verification display consisting essentially of one or more light emitting diodes (LED's) forming an alphanumeric verification configuration, one or more LED drivers, RAM for entry of access codes, and comparator circuitry for comparison of entry of an access code with the stored code; whereby entry of an access code, as a personal identification code, via said keyboard, into the RAM, activates the comparator circuitry to compare the entered personal identification code with the stored code in the non-volatile memory, with a match between the entered code and the stored code resulting in the comparator circuitry activating the one or more LED drivers, which in turn illuminate the one or more light emitting diodes into a pre-determined verification configuration as a verification display, wherein said verification display changes according to a preset algorithm contained in the non-volatile memory; said algorithm relating time and date of a transaction, as determined by said clock/calendar means, to the elapsed time from activation of the card to the time of a transaction, as determined by the timer means; whereby during a predetermined time length window a unique pre-determined verification configuration is generated and displayed by said one or more LED's, wherein different verification configurations are generated and displayed during different time windows, wherein the card further contains means for modulating the output of the one or more LED's whereby the one or more LED's blink in a pattern to provide alphanumeric information readable by an optical reader for transmission to a remote terminal, and wherein said one or more LED's blink at a slow rate with periods of active time when said LED's are powered and visible and periods of blank time when said LED's are not powered and are not visible, to conserve power of said non-replaceable power source.

5,180,903

MAGNETIC DETECTING UNIT HAVING ALIGNED SENSORS

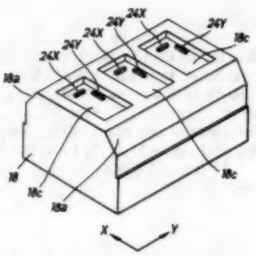
Yoshiharu Shigeno, Yokohama; Michihiro Murata, Ohharanonishi, and Yu Nishino, Ebina, all of Japan, assignors to Murata Mfg. Co., Ltd., Kyoto, Japan

Filed Mar. 21, 1990, Ser. No. 497,060

Claims priority, application Japan, Mar. 24, 1989, 1-33567[U]

Int. Cl.[5] G06K *7/08;* **G11B** *5/265, 5/29, 5/10*

U.S. Cl. 235—449 **9 Claims**



1. A magnetic sensor unit comprising:

a nonmagnetic sensor case having a plurality of sensor housing recesses formed in a surface, and a plurality of magnet housing recesses formed in an opposing surface of said sensor case at positions respectively corresponding to the sensor housing recesses, said sensor case having a bias adjusting portion disposed between each of said sensor housing recesses and each of said magnet housing recesses;

a nonmagnetic cover for covering at least the upper surface of said sensor case having said housing recesses;

magnets respectively housed in the magnet housing recesses of said sensor case;

magnetic sensors respectively housed in the sensor housing recesses of said sensor case, having magnetoelectric transducers magnetically biased by said magnets and first and second positioning edges arranged at a fixed angle relative to each other; and

positioning means formed in each of the sensor housing recesses and defined by first and second surfaces arranged at said fixed angle with respect to each other and in direct contact with the positioning edges of each of the sensors for positioning each of said magnetic sensors along a detection line and along a direction transverse to said detection line whereby magnetic characters are substantially simultaneously detected by said magnetic sensors for the output of detection signals by said magnetic sensors.

5,180,904

BAR CODE SCANNER WITH AUTOMATIC DE-ACTIVATION OF SCAN UPON BAR CODE RECOGNITION

Howard M. Shepard, Great River; Edward D. Barkan, South Setauket, and Jerome Swartz, Stonybrook, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Division of Ser. No. 272,545, Nov. 17, 1989, Pat. No. 5,130,520, which is a division of Ser. No. 148,555, Jan. 26, 1988, Pat. No. 4,845,350, which is a division of Ser. No. 883,923, Jul. 10, 1986, Pat. No. 4,758,717, which is a division of Ser. No. 519,523, Aug. 1, 1983, Pat. No. 4,673,805, which is a division of Ser. No. 342,231, Jan. 25, 1982, Pat. No. 4,409,470. This application Oct. 24, 1991, Ser. No. 781,893

The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.[5] G06K *7/10*

U.S. Cl. 235—470 **26 Claims**

1. A scanning device for reading bar code symbols, comprising:

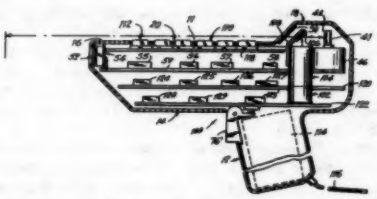
(a) a light source mounted in the device for generating a light beam, said light beam being directed along a path toward a bar code symbol exterior of the device;

(b) a scanner in said device in said path for scanning said light beam along a scan line across the bar code symbol, said scanner including a scan element driven by an electric motor;

(c) a sensor mounted in said device detecting the intensity of reflected light from said light beam traveling from said bar code symbol back to said device, and generating an electrical signal responsive to the intensity of said reflected light;

(d) signal processing means in said device to receive said electrical signal and to produce a digitized signal representing the bar code symbol;

(e) control circuitry for said device for automatically deenergizing at least one of said light source and said motor after said signal processing means has produced a digitized signal representing a valid bar code symbol.



8. A method of reading bar code symbols, comprising the steps of:

(a) activating a light source in a scan unit to generate a light beam directed along a path toward a ba cod symbol located exterior of he unit, reflected light from said light beam traveling from said bar code symbol back to said unit;

(b) activating a scanning element in said scan unit driven by an electric motor to scan said light beam along a scan line across the bar code symbol;

(c) detecting in said scan unit the intensity of said reflected light at said unit as said light beam moves along said scan line across the bar code symbol, and generating an electrical signal responsive to the intensity of said reflected light;

(d) decoding said electrical signal to generate bar code data;

(e) and automatically deactivating both said scan in response to said generating of said bar code data, wherein both said light source and said motor are deactivated by said step of automatically deactivating.

5,180,905

CARD READER APPARATUS WITH REPLACEABLE CARD GUIDE

Harold Chen, Taipei, Taiwan; Noah L. Anglin, San Jose, and Stanley J. Hludzinski, Auburn, both of Calif., assignors to VeriFone Inc., Redwood City, Calif.

Continuation-in-part of Ser. No. 617,344, Nov. 23, 1990, Pat. No. 5,164,576. This application Dec. 30, 1991, Ser. No. 816,130

Int. Cl.[5] G06K *13/06*

U.S. Cl. 235—483 **18 Claims**

1. In apparatus having a reader assembly for reading a data carrier having data stored on at least one data track thereon,

housing means defining a guide slot location for said data carrier;

transducer means for detecting said data stored on said data track;

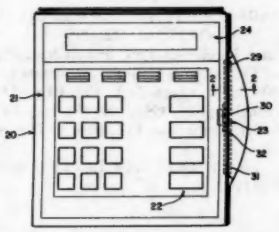
guide means removably mounted to said housing means at said data carrier slot location, said guide means having at least a bottom wall portion defining a bottom guide surface of a guide slot for said data carrier and one major side wall portion defining one side guide surface of a guide slot

for said data carrier and further defining an access window in said major side wall portion; and

frame means for carrying said transducer means in a prearranged location thereon;

said guide means and said frame means including:

a cooperative registration means, including at least one pair of position registration elements formed on said first side wall member and a cooperatively engaging pair of position registration elements formed on said frame means for



establishing an accurately registered mounting relationship therebetween and defining an accurate position location for said transducer means relative to said access window such that said data pickup element is accurately aligned with said data track; and

at least a pair of resilient hook arms carried on said first side wall member and cooperating with a pair of hook engaging surfaces on said frame means to mount said frame means to said guide means.

5,180,906

METHOD OF MANUFACTURING CARD

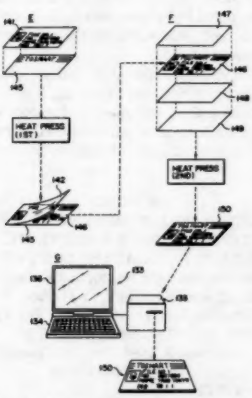
Shu Yamada, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 3, 1990, Ser. No. 562,676

Claims priority, application Japan, Aug. 9, 1989, 1-204756; Jan. 17, 1990, 2-6368; Apr. 27, 1990, 2-110433; Apr. 27, 1990, 2-110434

Int. Cl.[5] G06K *19/00*

U.S. Cl. 235—487 **14 Claims**



1. A method of manufacturing a card, comprising the steps of:

a first step of photographing objects and storing photographed objects as image data;

a second step of storing object data associated with the objects;

a third step of reading out, in combination, desired image data from the image data and part of the object data corresponding to the desired image data, and synthesizing the desired image data and the part of the object data;

a fourth step of printing out the synthesized data of the image data and the object data on a single transfer sheet;

a fifth step of combining the printed transfer sheet with a print sheet and, transferring the synthesized pattern from the transfer sheet to the print sheet which thereby serves as an identification sheet;

a sixth step of overlapping the identification sheet and sheets incorporating a data storage medium to form a card; and

a seventh step of storing the object data in the data storage medium.

5,180,907

METHOD AND APPARATUS FOR THE MEASUREMENT OF RAPID LIGHT VARIATION SUPERIMPOSED ON A SLOWLY CHANGING BACKGROUND LIGHT INTENSITY

Per Uddén, Hofstrasse 1, CH-6064 Kerns, Sweden, and Jan K. Ober, ul Brzechwy 6, PL-60-195 Poznan, Poland

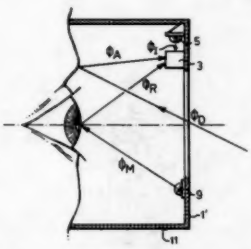
PCT No. PCT/SE88/00486, § 371 Date Apr. 9, 1990, § 102(e) Date Apr. 9, 1990, PCT Pub. No. WO89/02585, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 21, 1988, Ser. No. 469,540

Claims priority, application Sweden, Sep. 21, 1987, 8703637; Sep. 21, 1987, 8703638

Int. Cl.[5] G01J *1/32*

U.S. Cl. 250—205 **21 Claims**



1. A process for the measurement of light, where the incident light is derived from a first light source and is composed of background light, changing relatively slowly, and rapidly changing light variations, wherein a light sensitive element is used to produce a signal, indicative of the incident light comprising the steps of:

arranging a separate extra first light emitting element to emit extra light into said light sensitive element; and

controlling the amount of said extra light emitted from said light emitting element so as to cause the sum of said extra light and said background light, incident upon said light sensitive element, to be substantially constant.

5,180,908

DEVICE FOR DERIVING A CHANGE OF TIME-DEPENDENT INFORMATION BY CONVERTING THE INFORMATION TO POSITIONAL-DEPENDENT INFORMATION

Motohiro Suyama, Hamamatsu, Japan, assignor to Hamamatsu Photonics K.K., Shizuoka, Japan

Filed Sep. 13, 1991, Ser. No. 759,292

Claims priority, application Japan, Sep. 14, 1990, 2-245230

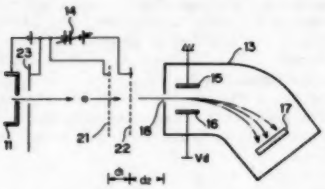
Int. Cl.[5] H01J *31/50*

U.S. Cl. 250—214 VT **19 Claims**

1. A device for deriving a change of time-dependent information represented by a series of charged particles, comprising:

a source for emitting the charged particles;

accelerating means for accelerating the charged particles emitted from said source and releasing the charged particles at varying speeds dependent on times of emission; and



analyzing means for analyzing the speeds of the released charged particles and providing output information varying in accordance with the speeds of the charged particles, the output information representing the change of the time-dependent information.

5,180,909

OPTICAL PICKUP USING DIFFRACTED LIGHT

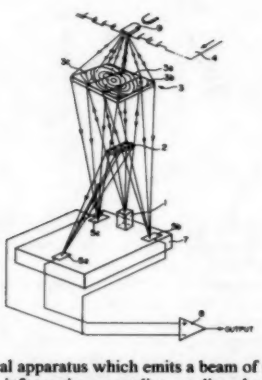
Minoru Ohyama, Sagamihara; Tetsuhiro Yamazaki, Yokohama; Hiroshi Inoue, Yokosuka, and Toshio Konno, Hoya, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 26, 1991, Ser. No. 691,963

Claims priority, application Japan, Apr. 27, 1990, 2-112941

Int. Cl.[5] H01J *3/14*; G01J *1/20*; G11B *7/00*

U.S. Cl. 250—216 **4 Claims**



1. An optical apparatus which emits a beam of reading light to an optical information recording medium having a pit in which information is stored and reads the information by means of the zero order reflected light reflected from the pit and the diffracted light generated on the pit by diffraction effect, comprising:

light generating means for generating the beam of reading light;

first photoelectric conversion means provided so that the zero order reflected light is incident thereto for generating a first electric signal corresponding to the intensity of the zero order reflected light incident thereto;

second photoelectric conversion means provided so that the diffracted light is incident thereto for generating a second electric signal corresponding to the intensity of the diffracted light incident thereto;

light focusing and guiding means, having a first grating lens of a first central optical axis and a second grating lens of a second central optical axis unequal to the first central optical axis, the first grating lens focusing the beam of reading light on the pit, the first and second grating lenses associating with each other to separate the zero order reflected light and the diffracted light, the first grating lens guiding the zero order reflected light to the first photoelectric conversion means and the second grating lens guiding the diffracted light to the second photoelectric conversion means; and

operating means for generating an output signal corresponding to the information stored in the pit by taking difference between the first and the second electric signals.

5,180,910

LIGHT BARRIER WITH RETROREFLECTOR AND OPTICAL MEANS

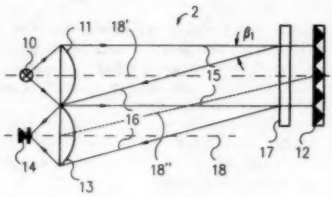
Hans H. Spratte, Kirchheim-Teck, and Rudiger Pepperl, Ratingen, both of Fed. Rep. of Germany, assignors to Leuze Electronic GmbH & Co., Owen-Teck, Fed. Rep. of Germany

Filed Sep. 20, 1991, Ser. No. 763,156

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1990, 4029766

Int. Cl.[5] G01V *9/04*; G08B *13/18*

U.S. Cl. 250—221 **14 Claims**



1. A reflected light barrier, comprising:

a light source for generating light;

a transmitting lens located for transmitting light generated by said light source along a beam path having a transmitting axis;

a retroreflector positioned for receiving the light transmitted by said transmitting lens and retroreflecting the transmitted light;

a light detector disposed on the same side of said retroreflector as said light source;

a receiving lens having a receiving optical axis and being disposed in front of said light receiver for collecting a portion of the retroreflected light and focusing the portion of retroreflected light onto said light detector, said transmitting lens and said receiving lens being arranged next to one another; and

optical means disposed along an optical path between said transmitting lens and said receiving lens for transmitting and redirecting the transmitted and retroreflected light for increasing the portion of retroreflected light oriented onto the receiving optical axis of said receiving lens.

5,180,911

PARAMETER MEASUREMENT SYSTEMS AND METHODS HAVING A NEURAL NETWORK COMPRISING PARAMETER OUTPUT MEANS

Barry G. Grossman, Satellite Beach, and Frank M. Caimi, Vero Beach, both of Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce and The Florida Institute of Technology, Inc., Melbourne, both of, Fla.

Filed Sep. 3, 1991, Ser. No. 753,983

Int. Cl.[5] H01J *5/16*

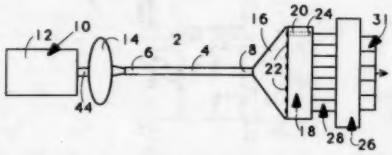
U.S. Cl. 250—227.21 **14 Claims**

1. A system for measuring the value of a parameter which comprises:

a single, multimode optical waveguide having an input portion and an output portion,

means for launching monochromatic coherent light into said input portion to propagate as multi modes in said waveguide,

an array of a plurality of spaced apart photodetectors each comprising a light receptor surface and signal output, said array being arranged to have light emitted from said waveguide output portion irradiate said light receptor surfaces,



an artificial neural network comprising a plurality of spaced apart neurons,

connector means to operatively impose weighted portions of said photodetector signal outputs upon said neurons and

said neural network further comprising parameter value output means.

5,180,912

DISPLAY SYSTEM WITH MEANS FOR VARIABLY DEFLECTING AN ARRAY OF OPTICAL EMITTERS

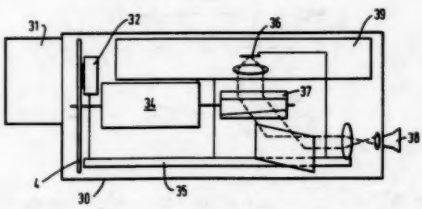
Robert K. McEwen, and Alan D. MacLeod, both of Essex, United Kingdom, assignors to GEC-Marconi Limited, Stanmore, United Kingdom

Filed Aug. 21, 1991, Ser. No. 748,080

Claims priority, application United Kingdom, Sep. 5, 1990, 9019336

Int. Cl.[5] H01J *3/14*

U.S. Cl. 250—234 **19 Claims**



1. An imager comprising: a lens for focusing received radiation onto a two dimensional array of sensor elements; mechanical means for displacing an image incident on the array of sensor elements relative to the array to effect microscan; an array of optical elements which generate an output in dependence upon radiation incident on the sensor array; and means for variably deflecting radiation from the optical elements, in synchronisation with the means for effecting microscan.

5,180,913

METHOD AND MASS SPECTROMETER FOR MASS SPECTROSCOPIC OR MASS SPECTROMETRIC INVESTIGATION OF PARTICLES

Hans-Jörg Laue, Bremen, Fed. Rep. of Germany, assignor to Finnigan Mat GmbH, Bremen, Fed. Rep. of Germany

Filed Jan. 25, 1991, Ser. No. 645,621

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1990, 4002849

Int. Cl.[5] A01J *49/00*; B01D *59/44*

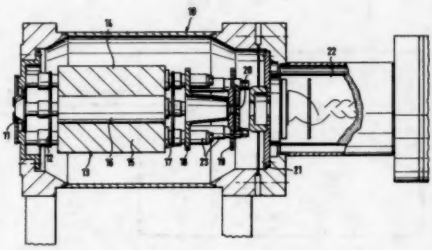
U.S. Cl. 250—281 **2 Claims**

1. A mass spectrometer including a separating system for separating a particle beam in accordance with different particle masses comprising:

a detecting device for detecting said particles when arriving at said detecting device;

a correction device comprising first correction means for keeping away particles having an energy being smaller than an expected energy to be detected away from said detecting device and second correction means for keeping away particles moving in a direction differing from an expected direction from said detecting device;

said first correcting means comprising at least one braking electrode to which a braking potential is applied and said second correcting means comprising a particle optical system;



an entry slit arranged upstream of said particle optical system;

said entry slit being held at a reference potential, successively arranged lenses being held at successively increasing potentials, said braking electrode having a maximum potential, and a focusing lens being arranged downstream of said braking electrode being held at said reference potential.

5,180,914

MASS SPECTROMETRY SYSTEMS

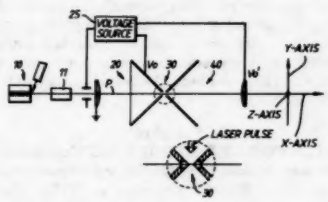
Stephen C. Davis, Fen Ditton, and Sydney Evans, Sale, both of England, assignors to Kratos Analytical Limited, Manchester, England

Filed May 7, 1991, Ser. No. 696,606

Claims priority, application United Kingdom, May 11, 1990, 9010619

Int. Cl.[5] H01J *49/40*

U.S. Cl. 250—287 **22 Claims**



1. A mass spectrometry system comprising

a source of ions for analysis,

a first time-of-flight means for separating the source ions according to their mass-to-charge ratios,

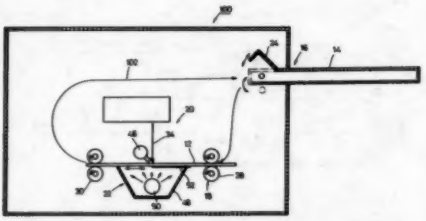
and a second time-of-flight means for analysing the mass-to-charge ratios of source ions which exit the first time-of-flight means and/or daughter ions derived from such source ions,

wherein the first time-of-flight means is an ion storage device comprising field generating means for subjecting the source ions to an electrostatic retarding field during an initial part only of a preset time interval, the electrostatic retarding field having a spatial variation such that source ions which have the same mass-to-charge ratio and enter the ion storage device at different times during said initial part of the preset time interval are all brought to a time focus during the remaining part of that preset time interval.

5,180,915
RADIATION IMAGE INFORMATION READING APPARATUS

Makoto Ohgoda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 16, 1991, Ser. No. 685,768
Claims priority, application Japan, Apr. 20, 1990, 2-105678
Int. Cl.[5] G01N *23/04*
U.S. Cl. 250—327.2 7 Claims



1. A radiation image information reading apparatus adapted for use with a double-sided storage type phosphor sheet having first and second sides and capable of storing radiation image information on said first and second sides, comprising:

at least one reading unit, all of the reading units being disposed on one side of a double-sided storage type phosphor sheet when said sheet is received by said apparatus, respective ones of said reading units exposing said one of said first and second sides of said storage type phosphor sheet to a stimulating ray for thereby photoelectrically reading information via light emitted from said storage type phosphor sheet; and

at least one erasing unit, all of the erasing units being disposed on the other of said first and second sides of said storage type phosphor sheet when said sheet is received by said apparatus to erase radiation image information on the other of said first and second sides of said storage type phosphor sheet, said erasing units being disposed in a position substantially opposed to said reading units,

wherein an operation of said reading units reading said information from said one of said first and second sides of said storage type phosphor sheet and an operation of said erasing units erasing said image information from said other of said first and second sides of said storage type phosphor sheet are simultaneously performed with respect to said first and second sides of said phosphor sheet.

5,180,916
APPARATUS FOR DETECTING IONIZING RADIATION

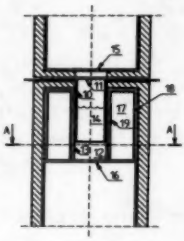
Kauko Lehtinen, Raisio; Timo Oikari, and Tapio Yrjönen, both of Turku, all of Finland, assignors to Wallac Oy, Turku, Finland

Filed Sep. 9, 1991, Ser. No. 756,694
Int. Cl.[5] G01T *1/204*
U.S. Cl. 250—367 11 Claims

1. A scintillation detector assembly having a measuring chamber accommodated to take the sample to be investigated, and two photodetectors for viewing said sample and being able to operate in coincidence in response to pulses produced by the sample in the measuring chamber, said detector assembly further comprising:

a case containing an additional scintillator, said case being adjacent said chamber and including a light-impermeable wall for optically isolating said additional scintillator from said chamber, said case optically isolating said additional scintillator from a predetermined one of said two photodetectors and being optically coupled to the other one of said two photodetectors so that the light generated in said additional scintillator is guided predominantly to one of said two photodetectors, and

comparator means for registering pulse amplitude disparity between said photodetectors to distinguish low-disparity,

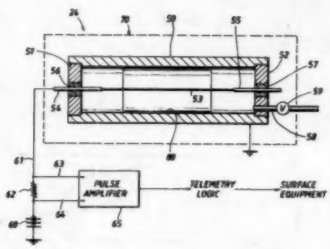


sample generated coincidence pulses and high-disparity, additional scintillator generated coincidence pulses.

5,180,917
SELF-CALIBRATING PROPORTIONAL COUNTER

Peter D. Wraight, Missouri City, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Continuation of Ser. No. 742,778, Aug. 8, 1991, abandoned. This application Sep. 4, 1991, Ser. No. 754,342
Int. Cl.[5] G01T *1/185;* G01V *5/10*
U.S. Cl. 250—374 37 Claims



1. A radiation detector of the proportional counter type comprising a pressure-tight closed container pervious to transmission therethrough of neutrons in the thermal and epithermal energy regions, an electrode extending through said container is spaced relation with the enclosing walls and insulated therefrom, a detector gas within said container consisting substantially of helium-3 at a superatmospheric pressure and having a tritium content of less than one part in ten-to-the-ten parts, a source of radioactivity capable of ionizing said gas, said source being disposed within said closed container and selected so as to have a radioactivity level of less than 5 nanocuries, and circuit connections extending to said electrode and to said container for application thereto of an electric potential, said source of radioactivity having a characteristic peak at energies greater than 3 MeV.

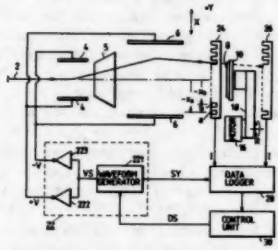
5,180,918
METHOD AND APPARATUS FOR MEASURING ION BEAM COLLIMATION, SHAPING THE ION BEAM AND CONTROLLING SCANNING THEREOF

Michiro Isobe, Kyoto, Japan, assignor to Nissin Electric Company, Limited, Kyoto, Japan

Filed May 15, 1991, Ser. No. 700,451
Claims priority, application Japan, May 17, 1990, 2-127230
Int. Cl.[5] H01J *37/30*
U.S. Cl. 250—492.2 11 Claims

5. An ion implanter for performing electrostatically-controlled collimated scanning using an ion beam emitted from an

ion beam source, said implanter comprising a first multipoint beam monitor location at a first location and a second multipoint monitor location at a second location, the first location being closer to the ion beam source than the second location,



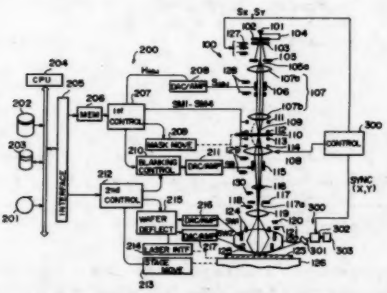
said monitors each comprising a plurality of beam detecting points positioned so that each monitor has the same set of detecting point coordinate values in a scanning direction of the ion beam for electrically detecting the ion beam, and the positions of the beam detecting points being predetermined.

5,180,919

ELECTRON BEAM EXPOSURE SYSTEM HAVING THE CAPABILITY OF CHECKING THE PATTERN OF AN ELECTRON MASK USED FOR SHAPING AN ELECTRON BEAM

Yoshihisa Oae; Kiichi Sakamoto, and Hiroshi Yasuda, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 18, 1991, Ser. No. 761,454
Claims priority, application Japan, Sep. 18, 1990, 2-249503
Int. Cl.[5] H01J *37/30*
U.S. Cl. 250—492.2 **9 Claims**



1. An electron beam exposure system for writing a pattern on an object, said electron beam exposure system having a capability of checking the pattern to be written on the object, comprising;

electron beam source means for producing an electron beam such that the electron beam ravels along an optical axis that extends from the electron beam source means to the object;

beam shaping means provided on the optical axis of the electron beam for shaping the electron beam such that the electron beam has a desired cross section, said beam shaping means having at least one selectable aperture pattern for passing the electron beam thee-through and thereby shaping same;

focusing means, provided along the optical axis between the beam shaping means and the object, selectively operable for focusing the electron beam, as shaped by as elected aperture pattern of the beam shaping means, on the object and such that an imaged of the selected aperture pattern of the beam shaping means, through which the electron beam has passed, is written on the object;

a screen, provided along the optical axis between the beam shaping means and the object, having an upper major surfaces for interrupting the electron beam when the electron beam is offset from the optical axis and further having a through-hole in alignment with the optical axis for passing the electron beam therethrough;

control means for controlling the focusing means, selectively, to project an image of a selected aperture pattern of the beam shaping means, through which the electron beam has passed, onto the upper major surface of said screen when checking the selected aperture pattern of the beam shaping means; and

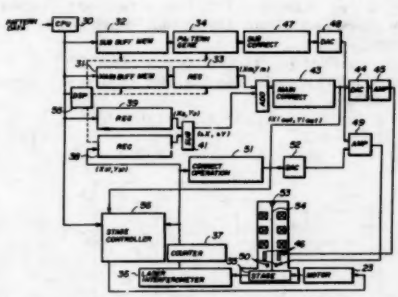
detection means for detecting the image of the selected aperture pattern that a is projected on the screen.

5,180,920

METHOD AND APPARATUS FOR MAKING CHARGED PARTICLE BEAM EXPOSURE

Junichi Kai; Hiroshi Yasuda, and Yoshio Watanabe, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 19, 1992, Ser. No. 854,086
Claims priority, application Japan, Mar. 20, 1991, 3-57469
Int. Cl.[5] H01J *37/302*
U.S. Cl. 250—492.2 **20 Claims**



1. A charged particle beam exposure method for exposing an exposure region of a substrate which is placed on a movable stage by irradiating a charged particle beam on the exposure region of the substrate, said charged particle beam exposure method comprising the steps of:

(a) dividing the exposure region into a plurality of band-shaped regions;

(b) deflecting the charged particle beam within a drawing range from one side to the other side of each band-shaped region in a longitudinal direction of the band-shaped region while continuously moving the stage in a stage moving direction, said drawing range being a range in which the charged particle beam can be deflected;

(c) monitoring a deflection position of the charged particle beam on the substrate along the stage moving direction; and

(d) varying a moving speed of the stage depending on the deflection position relative to one or a plurality of reference positions located along the stage moving direction within the drawing range.

5,180,921

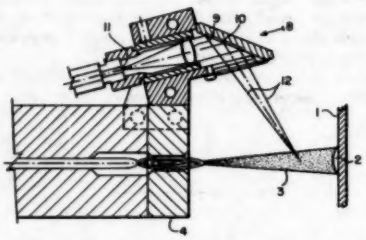
METHOD AND APPARATUS FOR MONITORING THE TEMPERATURE AND VELOCITY OF PLASMA SPRAYED PARTICLES

Christian Moreau; Mario Lamontagne, both of Boucherville, and Paolo Cielo, Montreal, all of Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Nov. 18, 1991, Ser. No. 793,518

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—554 **14 Claims**



1. A method of detecting characteristics of plasma sprayed particles in a plasma jet during flight between a plasma jet gun and a substrate, comprising the steps of focusing radiation emitted from a particle on a first photodetector through a slit mask formed of at least two parallel slits, and transmitting signals from the photodetector to a processor for determining the velocity of the particle from time delay between two or more peaks which are detected resulting from said radiation.

5,180,922

DISTANCE MEASURING APPARATUS WITH PHASE DETECTION

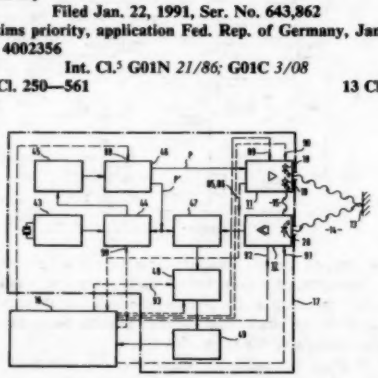
Gottfried Hug, Waldkirch, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Jan. 22, 1991, Ser. No. 643,862

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1990, 4002356

Int. Cl.[5] G01N *21/86*; G01C *3/08*

U.S. Cl. 250—561 **13 Claims**



1. Distance measuring apparatus comprising a photoelectric light receiver **(12)** and a photoelectric light transmitter **(11)** which is arranged alongside the photoelectric light receiver **(12)**, said light transmitter **(11)** comprising two opto-electronic light transmitting elements **(18, 19)**, which can be electronically switch in a complementary manner, said light transmitting means being fed by an oscillator device **(43, 44, 45, 46)** and alternately transmitting high frequency modulated light wave trains to the light receiver **(12)** via a measurement path **(14)** and a reflective target **(13)**, wherein the distance of the target from the light transmitter **(11)** to light receiver **(12)** is to be measured via reference path **(15)** of known length between the light transmitter **(11)** and the light receiver **(12)**, within the housing **(17)** and an electronic evaluation circuit which deduces, from the phase of the alternately received light wave trains, the spacing of the light transmitter **(11)** to light receiver **(12)** from the target **(13)**, as the speed of light and the known length of the reference path **(15)** is considered, characterised in the light receiver **(12)** containing only one single opto-electronic light receiving element **(20)**, which receives both the light wave trains from the measurement path **(14)** and also the light wave trains from the reference path **(15)**, said light receiving element being connected to one input of a multiplicatively operating mixing stage **(47)** belonging to the evaluation circuit, the other input of said mixing stage **(47)** being supplied with one output wave train signal P' of a digital phase shifter **(46)** which generates temporally one after the other four phase pairs with modulation frequency, the phase pairs being adjustable in a 90° raster, the other output wave train signal P of the digital phase shifter **(46)** being supplied to the light transmitter **(11)**, the light wave trains having a wavelength on the order of magnitude of the distance to be measured, the electronic evaluation circuit measuring the phase difference of the modulation of the light wave trains which have passed along the measurement path **(14)** and the light wave trains which have passed along the reference path **(15)** by connecting an approximation filter **(48)** with a particular narrow band design to the output of the mixing stage **(47)**, the approximation filter **(48)** forming the integral ($P \times P'$) of the two wave train signals (P, P'). and the signal occurring at the output of the approximation filter **(48)** being evaluated in a microprocessor **(16)** belonging to the evaluation circuit for obtaining the difference of the transit times of the light wave trains via the measurement path **(14)**, on the one hand and the transmit time via the reference path **(15)**, on the other hand.

5,180,923

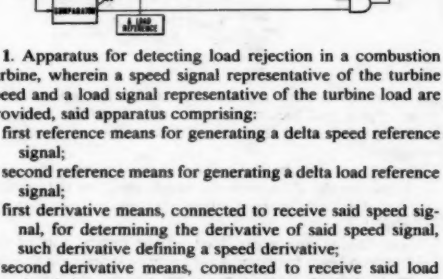
METHOD AND APPARATUS FOR DOWNLINE LOAD REJECTION SENSING IN A GAS TURBINE CONTROL SYSTEM

Paul J. Tyler, Winter Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 1, 1990, Ser. No. 607,921

Int. Cl.[5] F02C *9/28*

U.S. Cl. 290—40 C **23 Claims**



1. Apparatus for detecting load rejection in a combustion turbine, wherein a speed signal representative of the turbine speed and a load signal representative of the turbine load are provided, said apparatus comprising:

first reference means for generating a delta speed reference signal;

second reference means for generating a delta load reference signal;

first derivative means, connected to receive said speed signal, for determining the derivative of said speed signal, such derivative defining a speed derivative;

second derivative means, connected to receive said load signal, for determining the derivative of said load signal, such derivative defining a load derivative;

first comparator means, connected to receive said speed derivative and said delta speed reference signal, for comparing the speed derivative to said delta speed reference signal;

second comparator means, connected to receive said load derivative and said delta load reference signal, for com-

paring the load derivative to said delta load reference signal; and

an indicator for indicating when both said first comparator means determines that said speed derivative exceeds said delta speed reference signal and said second comparator means determines that said load derivative exceeds said delta load reference signal.

5,180,924

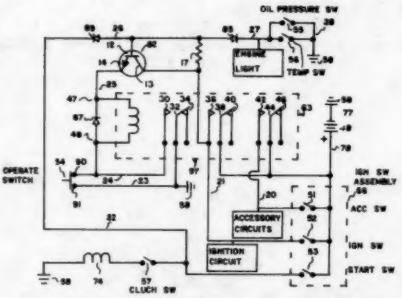
IGNITION SWITCH BYPASS CIRCUIT

Rick Rudisel, 7550 SE. Harney, Portland, Oreg. 97206

Continuation-in-part of Ser. No. 487,912, Mar. 5, 1990. This application Aug. 26, 1991, Ser. No. 749,879

Int. Cl.[5] B60R *25/10*

U.S. Cl. 307—10.6 **15 Claims**



15. An ignition bypass switch for a motor vehicle having a battery, an ignition circuit, and a key - activated ignition switch, comprising:

a bypass switch means which bypasses the ignition switch for connecting the battery to the accessory and ignition circuits,

a driver actuatable switch,

sensor means sensing at least two of placing the vehicle in gear, engine overheating, and oil pressure loss, and

control means receiving the driver actuable switch and the sensor means as inputs and controlling the bypass switch means such that the bypass switch means is closed or made conductive in response to actuation of the driver actualable switch and the bypass switch means is opened or made nonconductive in response to the sensor means sensing at least one of placing a vehicle in gear, engine overheating, and oil pressure loss,

wherein a driver may remove a key from the ignition and have the vehicle remain in a running condition.

5,180,925

REMOTE SWITCHING SYSTEM FOR AN ELECTRIC TROLLING MOTOR

Matthew J. Lieb, Northbrook, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 22, 1991, Ser. No. 659,851

Int. Cl.[5] H01H *35/01*

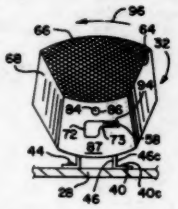
U.S. Cl. 307—114 **6 Claims**

1. A remote switching system for an electric trolling motor mounted in a boat, comprising:

an electric trolling motor having a control head;

a portable source of electric power;

at least one remote switching station adapted to be mounted to the boat and being connected to said motor and to said power source, each said station including a foot-operated actuator means operationally associated with a push-button switch, and said actuator having locking means incorporated therein for releasably locking said switch in a closed position when said actuator means is depressed momentary operaton of said trolling motor or is depressed



and rotated for locked ON operation of said trolling motor.

5,180,926

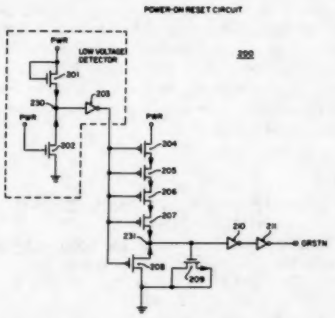
POWER-ON RESET ARCHITECTURE

Michael R. Skripek, San Jose, Calif., assignor to Sequoia Semiconductor, Inc., Scotts Valley, Calif.

Filed Nov. 26, 1991, Ser. No. 798,190

Int. Cl.[5] H03K *19/02, 17/16*

U.S. Cl. 307—272.3 **11 Claims**



1. A circuit architecture generating a reset signal for resetting an active device in an integrated circuit (IC), said active device being reset in response to said reset signal, said circuit architecture comprising:

first delay means for generating a first signal, said first signal at a first logic level when said active device is powered below a predetermined level and at a second logic level when said active device is powered to at least said predetermined level, said predetermined level being the functional power level of said active device; and

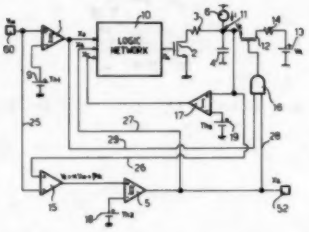
second delay means for generating said reset signal to said active device in response to said first signal being as said first logic level, said second delay means generating said reset signal until a first predetermined time after said first delay means generates said first signal at said second logic level, such that after said first predetermined time, said second delay means discontinues resetting said active device, and further wherein after said active device is powered to said predetermined level, said first delay means asserts said first signal at said first logic level when said active device becomes powered below said predetermined level for a second predetermined time, such that said second delay means reasserts said reset signal.

5,180,927

RESET DEVICE FOR MICROPROCESSOR, PARTICULARLY FOR AUTOMOTIVE APPLICATIONS

Vanni Poletto, Camino, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Nov. 20, 1991, Ser. No. 794,939
Claims priority, application Italy, Nov. 20, 1990, 67907 A/90
Int. Cl.[5] G11C *11/00*; H03K *3/01*
U.S. Cl. 307—272.3 **10 Claims**



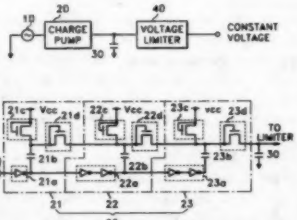
1. A reset device for a microprocessor, particularly for automotive applications, defining an input terminal and an output terminal, and comprising a first comparing stage having first and second inputs connected, respectively, to said input terminal and to a first source of a first threshold signal; a switch controlled by said first comparing stage, for switching between a closed and an open state; a capacitive element coupled to said switch and being charged and discharged depending on the state of said switch; and a second comparing stage having first input-connected to a second source of a second threshold signal, for generating a reset signal having two different logic states and supplied to said output terminal; characterised by an adding element having first and second inputs connected, respectively, to said input terminal and to said capacitive element, and including an output connected to a second input of said second comparing stage.

5,180,928

CONSTANT VOLTAGE GENERATION OF SEMICONDUCTOR DEVICE

Yun-ho Choi, Incheon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Sep. 30, 1991, Ser. No. 767,616
Int. Cl.[5] H03K *3/013*
U.S. Cl. 307—296.6 **7 Claims**



1. A constant voltage generator of a semiconductor device comprising:

an oscillator for generating an AC signal;

a charge pump for pumping a charge from a power voltage supply line by a predetermined pumping ratio in accordance with the AC signal of said oscillator;

a charge storage capacitor for storing the charge pumped by said charge pump; and

a voltage limiter for limiting the voltage across said charge storage capacitor to a predetermined voltage, and outputting a constant voltage,

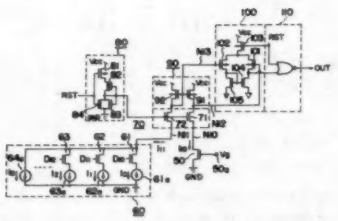
wherein said charge pump is formed by a plurality of stages each including: an amplifier for amplifying said AC signal supplied from a preceding stage, which also delays said AC signal for a predetermined time interval; a pump capacitor for storing a charge while the state of said amplifier's output is low, and for discharging during the output's high state of the output; a first pump diode for supplying the charge from said power voltage supply line to said pump capacitor; and a second pump diode for supplying the charge stored in said pump capacitor to the pump capacitor of a succeeding stage.

5,180,929

VOLTAGE MEASURING CIRCUIT

Hitoshi Kokubun, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 12, 1991, Ser. No. 713,796
Claims priority, application Japan, Jun. 13, 1990, 2-154254
Int. Cl.[5] G06G *7/10*; H03K *5/153*
U.S. Cl. 307—350 **19 Claims**



1. A voltage measuring circuit comprising:

a current converter having an input terminal and a first current terminal for converting a voltage applied to the input terminal thereof into a current at the first current terminal thereof;

a reference current generating circuit having a second current terminal for generating a reference current on the second current terminal thereof;

a current/voltage converting circuit having first and second nodes and first and second output terminals, the current-/voltage converting circuit converting currents at the first and second nodes thereof into voltages outputted at the first and second output terminals; and

a voltage transmitting circuit having a first path electrically connected between the first node of said current/voltage converting circuit and the first current terminal, and a second path electrically connected between the second node of said current/voltage converting circuit and the second current terminal, the first path and the second path having the same impedance.

5,180,930

METHOD AND APPARATUS FOR REDUCING THE EFFECTS OF FEEDBACK SWITCH CHARGE INJECTION INTO A PLURALITY OF SERIALLY CONNECTED SAMPLE DATA COMPARATORS

Michael K. Mayes, Sunnyvale, Calif., assignor to National Semiconductor Corp., Santa Clara, Calif.

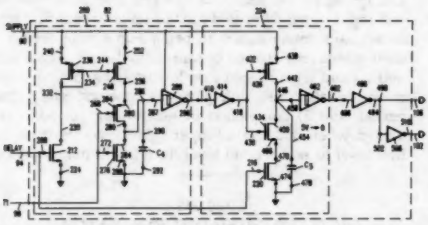
Filed May 17, 1991, Ser. No. 703,030
Int. Cl.[5] H03K *17/16, 5/24*; G11C *27/02*
U.S. Cl. 307—353 **34 Claims**

1. In an apparatus having first and second serially coupled sample data comparators, the first sample data comparator including a first feedback switch coupled thereto that is activated by a switching signal, and the second sample data comparator including a second feedback switch coupled thereto that is activated by the switching signal, an apparatus for

reducing effects of charge injection from the first and second feedback switches comprising:

delay selection means for selecting an amount of signal delay;

delay means, coupled to the delay selection means and to the second feedback switch, for delaying the receipt of the switching signal by the second feedback switch from the receipt of the switching signal by the first feedback switch by the selected amount of signal delay, the delay means comprising:



voltage ramp means for ramping a voltage in response to the switching signal;

comparing means, coupled to the voltage ramp means, for comparing the ramped voltage to a threshold value; and

delayed signal generating means, coupled to the comparing means, for communicating the switching signal to the second feed back switch when the ramped voltage passes the threshold value.

5,180,931

SAMPLING METHOD AND CIRCUIT

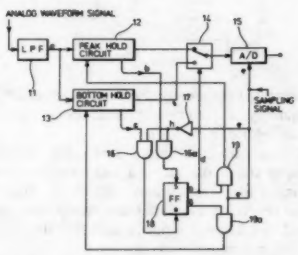
Hajime Harada, Tokyo, Japan, assignor to Nihon Kohden Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 441,069, Nov. 22, 1989, abandoned. This application Sep. 24, 1991, Ser. No. 764,611

Claims priority, application Japan, Feb. 12, 1988, 63-304079

Int. Cl.[5] H03K *5/153;* **G11C** *27/02*

U.S. Cl. 307—353 **4 Claims**



1. A method of sampling input waveform signals during a predetermined sampling period by detecting a peak and a bottom in each period, the improvement comprising:

generating as hold values a peak level and a bottom level of an input waveform signal;

holding one of the peak level and bottom level as hold values by resetting one of a peak hold means and a bottom hold means to the level of said input waveform signal at a time of generating the hold values;

determining whether the peak hold means or the bottom hold means is resetting at a time of sampling or at a time prior to sampling; and

generating a bottom level as a sampling value when the peak hold means is resetting at a time of sampling and generating a peak level as a sampling value when the bottom hold means is resetting at the time of sampling.

5,180,932

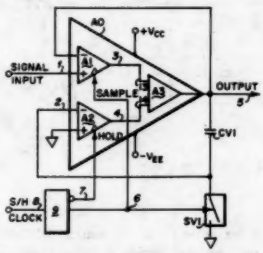
CURRENT MODE MULTIPLEXED SAMPLE AND HOLD CIRCUIT

David W. Bengel, 5939 Amapola Dr., San Jose, Calif. 95129

Continuation-in-part of Ser. No. 494,197, Mar. 15, 1990, abandoned. This application Mar. 11, 1991, Ser. No. 668,379

Int. Cl.[5] H03K *17/16;* **G11C** *27/02*

U.S. Cl. 307—353 **22 Claims**



1. A sample and hold circuit having a signal input, an output and a control logic input, said control logic input being responsive to logic signals that command said circuit to operate in a sample mode in which said output replicates said signal input or in a hold mode in which said output holds the signal input value present at the instant of the hold logic command, said circuit comprising:

an output stage having an output suitable for providing said circuit output and an input;

first and second differential input stages each having outputs commonly connected to drive said input of said output stage and each having inverting and noninverting differential inputs, said first and second differential input stages having substantially equal operating characteristics including substantial signal gain;

means for coupling said noninverting input of said first differential input stage to said signal input whereby said circuit responds to said input;

means, responsive to said logic signals, for alternately turning said first and second differential input stages on whereby when said sample mode is commanded said first differential input stage is on and when said hold mode is commanded said second differential input stage is on;

hold capacitor means coupled between said output of said output stage and the inverting input of said second differential input stage to produce negative feedback in said hold mode; and

first switch means coupled between said inverting input of said second differential input stage and a source of reference potential and means for turning said first switch means on when said sample mode is commanded whereby the charge on said hold capacitor means follows said output signal in said sample mode.

5,180,933

PROGRAMMABLE DIGITAL OUT-OF-LOCK DETECTOR

Robert V. Krzyzanowski, Plano, Tex., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 26, 1991, Ser. No. 798,470

Int. Cl.[5] H03K *9/06, 5/26*

U.S. Cl. 307—514 **14 Claims**

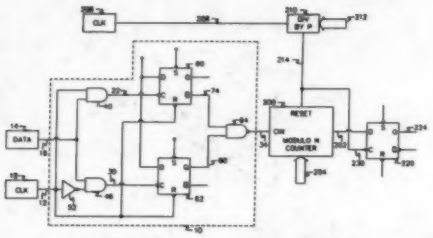
1. An apparatus for detecting a deviation of a data signal from another signal of a predefined frequency, comprising:

first means for providing a first series of pulses at said predefined frequency;

second means for providing a second series of pulses, each of

said second series of pulses being indicative of a first relationship between each of said first series of pulses and a coincident pulse of said data signal, said second providing means being connected in signal communication with said first providing means;

third means for providing a third series of pulses, each of said third series of pulses being indicative of a second relationship between each of said first series of pulses and said coincident pulse of said data signal, said third providing means being connected in signal communication with said first providing means;



means for determining the sequential relationship between each of said second series of pulses and a sequentially related pulse of said third series of pulses, said determining means being connected in signal communication with said second and third providing means;

fourth means for providing an output signal representing said sequential relationship;

means for defining a time period having a predefined length; and

means for counting changes in magnitude of said output signal during said time period, said counting means being connected in signal communicating with said fourth providing means.

5,180,934

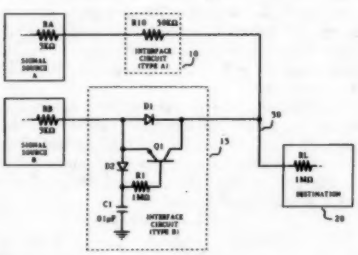
SELF-ENABLING DATA-COLLISION AVOIDANCE ARRANGEMENT USING A PEAK DETECTOR

Kevin E. Nortrup, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed May 28, 1991, Ser. No. 705,613

Int. Cl.[5] H03K *5/22, 17/28*

U.S. Cl. 307—518 **15 Claims**



11. Apparatus comprising:

a first input for receiving a first input signal from a first input signal source exhibiting a first impedance;

a second input for receiving a second input signal from a second input signal source exhibiting a second impedance substantially less than said first impedance;

an output coupled to said first input for providing an output signal to a signal destination exhibiting a third impedance substantially greater than said first impedance;

switch means responsive to a control signal for decoupling said second input from said output in a first mode of operation causing said output signal at said output to represent said first input signal, and for coupling said second input to said output in a second mode of operation causing said output signal to represent said second input signal; and

means responsive to said second input signal for generating said control signal so that said switch means exits said first mode of operation and enters said second mode of operation when said second input signal changes from a first level to a second level, and so that said switch means exits said second mode of operation and enters said first mode of operation following completion of a timing period;

said control means including timing means for establishing said timing period such that 1) a first change of said second input signal from said second level to said first level causes said timing means to begin said timing period, 2) each subsequent change of said second input signal from said second level to said first level retriggers said timing means causing said timing means to begin said timing period, and 3) completion of said timing period is prevented when said second input signal changes from said first level to said second level during said timing period.

5,180,935

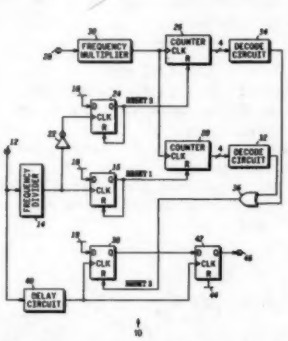
DIGITAL TIMING DISCRIMINATOR

Behrooz Abdi, Chandler, and Gary Stuhlmiller, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 610,876, Nov. 9, 1990, abandoned. This application Jan. 10, 1992, Ser. No. 821,290

Int. Cl.[5] H03K *9/06*; **H03D** *3/02*

U.S. Cl. 307—524 **5 Claims**



1. An integrated frequency discriminator circuit for detecting the frequency of a data input signal about a predetermined frequency threshold, comprising:

a first flipflop circuit having a data input, a clock input, a reset input and an output, said data input being coupled for receiving a first logic signal, said clock input being coupled for receiving the data input signal, said output being coupled to said reset input of said first flipflop circuit for providing a first reset signal;

a first counter having a clock input, a reset input and an output, said clock input being coupled for receiving a reference signal for adjusting a first count value, said reset input being coupled for receiving said first reset signal for resetting said first count value;

a first decode circuit having an input coupled to said output of said first counter and having an output for providing an output signal having said first state while said first count value is equal to a predetermined count threshold and a second state when said first count value is not equal to said predetermined count threshold;

a second flipflop circuit having a data input, a clock input, a reset input and an output, said data input being coupled for receiving said first logic signal, said clock input being coupled for receiving the data input signal, said reset input

being coupled for receiving said output signal of said first decode circuit; and

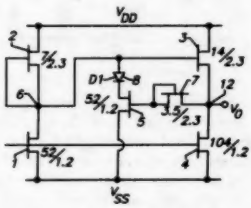
a third flipflop circuit having a data input, a clock input and an output, said data input being coupled to said output of said second flipflop circuit, said clock input being coupled for receiving the data input signal, said output providing an output signal having said first state when said first count value is reset before reaching said predetermined count threshold and having said second state when said first count value reaches said predetermined count threshold.

5,180,936

HIGH SPEED LOGIC CIRCUIT

James McDonald, Thousand Oaks, Calif., assignor to Vitesse Semiconductor Corp., Camarillo, Calif.

Filed Aug. 8, 1991, Ser. No. 742,300
Int. Cl.[5] H03K *19/094*
U.S. Cl. 307—348 **4 Claims**



1. A high speed logic circuit comprising:

first and second power bus means;

first resistor means;

first pull-down GaAs transistor means having gate means and a pair of main electrode means, the transistor means being coupled between the first and second power bus means in series with the resistor means via its pair of main electrode means, the output from the transistor means being produced at a selected one of its main electrode means, the transistor means producing an output logic level signal at its output in response to a logic level input signal at its gate means;

push-pull buffer means responsive to the input signal to provide an output signal from the circuit, the push-pull buffer means minimizing the rise time associated with the transition of the transistor means output; and

switched clamp means including second GaAs transistor means and diode means, the second transistor means having gate means being a pair of main electrode means, the second transistor means being coupled via its pair of main electrode means in series with the diode means between the output of the first transistor means and the second power bus means so as to divert current from the first resistor means to the second power bus means when turned on by a sufficient signal level applied to its gate means,

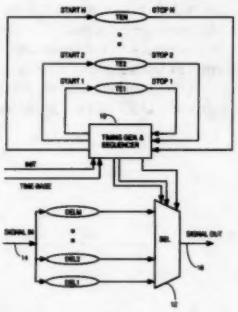
the switched clamp means further including resistor means coupled between the circuit output and the gate means of the second transistor means to limit current flow to the second transistor means' gate means from the circuit output.

5,180,937

DELAY COMPENSATOR AND MONITOR CIRCUIT HAVING TIMING GENERATOR AND SEQUENCER

Douglas Laird, Los Gatos, and Godfrey P. D'Souza, Santa Clara, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Feb. 28, 1992, Ser. No. 843,700
Int. Cl.[5] H03K *5/159*
U.S. Cl. 307—602 **7 Claims**



1. A delay compensator circuit connectable to a signal path of a circuit to be compensated, said delay compensator circuit comprising:

at least one test delay element having an input terminal and an output terminal;

a timing generator and sequencer circuit coupled to said test delay element, said timing generator and sequencer circuit providing a test signal to the input terminal of said test delay element and monitoring the output terminal of said test delay element at a given time after said test signal is provided to said input terminal of said test delay element, wherein said timing generator and sequencer circuit generates a delay select signal indicative of a voltage level at said output terminal of said test delay element at the given time;

at least one signal path delay element selectively connectable into the signal path of the circuit to be compensated; and

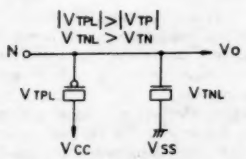
means for switching said signal path delay element into said signal path depending upon said delay select signal.

5,180,938

SIGNAL DELAY CIRCUIT HAVING SPECIFIED TRANSISTOR THRESHOLD LEVELS

Yun-seung Sin, Kyunggi, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 14, 1991, Ser. No. 715,624
Claims priority, application Rep. of Korea, Mar. 21, 1991, 91-4505
Int. Cl.[5] H03K *5/13, 3/26*
U.S. Cl. 307—605 **16 Claims**



1. A signal delay circuit having a load capacitance, comprising:

driving circuit means for developing an output signal at a

node in response to an input signal, and including pull-up means coupled between said node and a supply voltage and pull-down means coupled between said node and ground voltage, said pull-up and pull-down means having predetermined respective threshold voltages; and

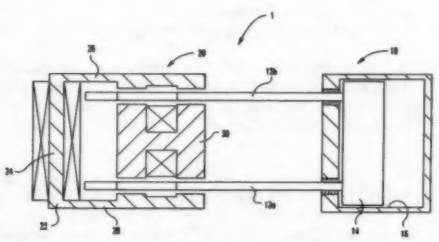
capacitive load means coupled to said node for receiving said output signal and having at least one threshold voltage the absolute value of which is larger than the absolute value of a corresponding predetermined threshold voltage of said pull-up and pull-down means, such that the load capacitance of said signal delay circuit has a first capacitance value until said output signal rises to a first predetermined voltage, increases to a second capacitance value at said predetermined voltage, and decreases to a third capacitance value from said second capacitance value when said output signal rises to a second predetermined voltage.

5,180,939

MECHANICALLY COMMUTATED LINEAR ALTERNATOR

Mark A. Rosswurm, Columbus, Ind., assignor to Cummins Power Generation, Inc., Columbus, Ind.

Filed Feb. 24, 1992, Ser. No. 840,466
Int. Cl.[5] H02K *35/00*
U.S. Cl. 310—27 **21 Claims**



1. A device for generating an alternating electrical current comprising:

a magnetically conductive stator forming a magnetic circuit,

a magnetic field exciter coil responsive to an input electrical current for providing a magnetic flux field,

an inductive output coil defining an electrical circuit having an electrical current induced by alternation of said magnetic flux field, and

at least two reciprocating elements having at least a first and second position, one reciprocating element having at least one magnetically conductive region and the other of said reciprocating elements having at least two magnetically conductive regions;

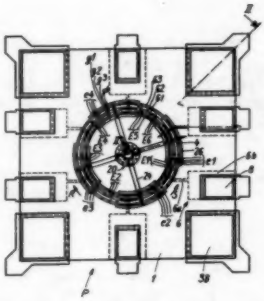
said reciprocating elements moving to said first position to form a first magnetic circuit and causing an induced electrical current in said inductive output coil having a maximum positive value, and said reciprocating elements moving to said second position to form a second magnetic circuit and causing an induced electrical current in said inductive output coil having a maximum negative value.

5,180,940

RADIAL FIELD ELECTROSTATIC MICROMOTOR PRODUCED USING A PHOTOLITHOGRAPHIC MICROMANUFACTURING TECHNIQUE AND A PROCESS FOR PRODUCING SAID MICROMOTOR

Lionel Paratte, Neuchâtel; Etienne Bornand, Boudry, and Georges-André Racine, La Chaux-de-Fonds, all of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

PCT No. PCT/CH91/00030, § 371 Date Sep. 11, 1991, § 102(e) Date Sep. 11, 1991, PCT Pub. No. WO91/12650, PCT Pub. Date Aug. 22, 1991
PCT Filed Feb. 6, 1991, Ser. No. 752,580
Claims priority, application Switzerland, Feb. 9, 1990, 00426/90; France, Feb. 23, 1990, 90 02385
Int. Cl.[5] H02N *1/00*
U.S. Cl. 310—40 MM **18 Claims**



1. A radial field electrostatic micromotor produced by photolithographic micromanufacture of the type comprising:

a stator having at least one group of a plurality of stator electrodes angularly offset about an axis of rotation of the micromotor, said stator electrodes being connected electrically to a control circuit supported on a substrate,

a rotor, preferably composed at least in part of an electrically conducting material, having at least one counter electrode adapted to pass across each stator electrode substantially in one plane designated the electrostatic field plane, whereby a clearance between said counter electrode and a stator electrode forms an air gap,

a ring forming a bearing adapted to receive an electrical power supply and which is integral with said substrate, said rotor being guided rotatably and optionally in translation about said ring by means of a guide part with which said counter electrode is integral, wherein said rotor has at least one bridging element disposed at least in part about said electrostatic field plane, said bridging element constituting an elevated arm of the rotor carrying one or more mechanically or electrically functional members adapted to cooperate with one or more complementary members located inside or outside the electrostatic field plane and inside or outside said group of stator electrodes.

5,180,941

VIBRATION DRIVEN MOTOR APPARATUS

Hiroyuki Seki, Urawa, and Atsushi Kimura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1990, Ser. No. 611,888
Claims priority, application Japan, Nov. 10, 1989, 1-293127
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—323 **8 Claims**

1. A vibration driven motor, comprising:

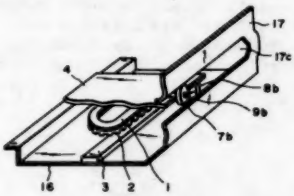
a vibration member responsive to an applied electrical signal for generating a vibration therein;

a contact member which is in contact with said vibration member, the vibration generated in said vibration member

effecting relative movement between said vibration member and said contact member;

a support member for movably supporting one of said vibration member or said contact member;

a first and second roller arrangements functionally engaged with said support member;



a first guide member in contact with said first roller arrangement, said first guide member preventing said first roller arrangement from sliding in a horizontal direction; and

a second guide member in contact with said second roller arrangement, said second guide member preventing said second roller arrangement from sliding in a vertical direction.

5,180,942

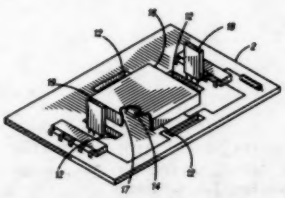
THERMALLY ISOLATED OVENIZED CRYSTAL OSCILLATOR

Dennis F. Marvin, Roselle, and Maria Hernandez-Solis, Elgin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 14, 1992, Ser. No. 835,792

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—346 **4 Claims**



1. A temperature controlled ovenized crystal oscillator comprising:

a piezoelectric device;

an enclosure comprised of a heat conductive material substantially enclosing a volume in which said piezoelectric device is located;

a transistor for supplying thermal energy to said enclosure, said transistor thermally coupled to the enclosure; and

a circuit board having a plurality of perforations the locations of which define an area in which said enclosure and said transistor and said piezoelectric device are exclusively located, said perforations substantially thermally isolating said enclosure from sections of said circuit board beyond said perforations.

5,180,943

PHOTOMULTIPLIER TUBE WITH DYNODE ARRAY HAVING VENETIAN-BLIND STRUCTURE

Hiroyuki Kyushima, Hamamatus, Japan, assignor to Hamamatsu Photonics K.K., Shizuoka, Japan

Filed Nov. 8, 1990, Ser. No. 610,657

Claims priority, application Japan, Nov. 10, 1989, 1-293345

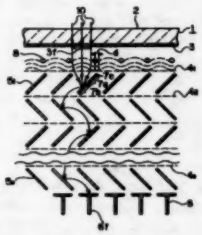
Int. Cl.[5] H01J *43/18, 43/22*

U.S. Cl. 313—535 **11 Claims**

1. A venetian-blind type of photomultiplier tube for converting an incident light into an amplified electrical signal, comprising:

a photocathode for converting the incident light into photoelectrons,

a venetian-blind type of dynode array for emitting secondary electrons with multiplication upon incidence of the photoelectrons thereto, said dynode array comprising plural dynode rows arranged in a first direction, each of said dynode rows comprising plural dynode elements arranged at a constant pitch in a second direction and each of said



dynode elements having a plate inclined to the first direction for emitting the secondary electrons;

an anode array comprising plural anodes arranged in the second direction for collecting the secondary electrons emitted from said dynode array and outputting an amplified electrical signal corresponding to the light; and

one or more electron-flight control members for convergently and concentrically directing at least one stream of the photoelectrons and the secondary electrons to a lower portion of each of said dynode elements.

5,180,944

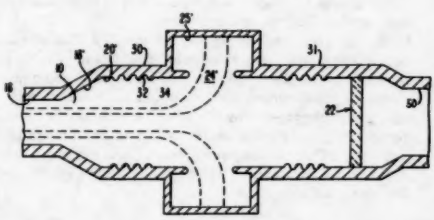
GYROTRON WITH A MODE CONVERTOR WHICH REDUCES EM WAVE LEAKAGE

Jeffrey M. Neilson, Mountain View, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 25, 1991, Ser. No. 645,946

Int. Cl.[5] H01J *23/16*; H01P *1/16*

U.S. Cl. 315—5 **6 Claims**



1. In a gyrotron having an electron beam generator, an output waveguide, and a dielectric EM output window, a DC magnetic field generating means, an interaction circuit located between said electron beam generator and said output waveguide for receiving and transmitting an electron beam generated from said beam generator in a linear direction toward said output waveguide, said interaction circuit including a resonator capable of supporting and propagating an electromagnetic wave including energy associated therewith in a first transverse electric (TE_{nm}) mode having an azimuthal mode number n,

said output waveguide coupled to said interaction circuit for propagating said electromagnetic wave in said first TE_{nm} wave toward said EM window along a propagation path and for transmitting said electron beam away from said resonator toward a location away from said electron beam

generator, said output waveguide having a gap therein, said gap being disposed between said resonator and said dielectric EM output window, said dielectric EM output window being mounted across an interior of said waveguide, THE IMPROVEMENT COMPRISING

a portion of said output waveguide in the propagation path of said electromagnetic waves between said resonator and said gap being capable of also transmitting a second electromagnetic wave in a TE_{nm} mode having a radial mode number m, different than the radial mode number of said first mode, and

at least a part of said portion of said output waveguide in the propagation path of said electromagnetic wave between said resonator and the commencement of said gap being a mode converter for diverting part of the energy from said first mode into said second mode to reduce, in operation, leakage of wave energy from said output waveguide through said gap.

5,180,945

ELECTRON GUN FOR CATHODE RAY TUBE

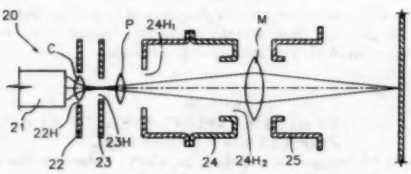
Yong-geol Kweon, Seoul, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyunggi-do, Rep. of Korea

Filed Dec. 31, 1991, Ser. No. 814,814

Claims priority, application Rep. of Korea, Mar. 14, 1991, 91-3426

Int. Cl.[5] H01J *29/46, 29/56*

U.S. Cl. 315—14 **3 Claims**



1. An electron gun for a cathode ray tube, comprising:

a cathode for generating thermoelectrons; 'a sequentially arranged control electrode and screen electrode each having three in-line type electron beam passing holes, for transforming the thermoelectrons emitted from said cathode into an electron beam; and

a focus electrode and an anode for initially focusing and accelerating said generated electron beam, wherein a diameter of the electron beam passing holes of said control electrode, said screen electrode and an incident side of said focus electrode are 0.7 mm, 0.6 mm and 1.53 mm, respectively, while a diameter of the electron beam passing holes of an outgoing side of said focus electrode and a diameter of the electron beam passing holes of said anode are about 4.1 mm.

5,180,946

MAGNETRON HAVING COAXIAL CHOKE MEANS EXTENDING INTO THE OUTPUT SIDE INSULATING TUBE SPACE

Masayuki Aiga, Kanzaki, and Yoshitaka Shibata, Kasai, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 8, 1991, Ser. No. 653,429

Claims priority, application Japan, Feb. 15, 1990, 2-35217; Apr. 25, 1990, 2-109098

Int. Cl.[5] H01J *23/54, 25/50*

U.S. Cl. 315—39.51 **6 Claims**

3. A magnetron for producing microwave energy at a predetermined fundamental frequency comprising:

an anode of cylindrical shape with an inner surface;

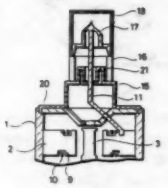
a plurality of vanes attached to the inner surface of said anode;

a cathode disposed inside of and spaced from said anode for emitting electrons;

a cylindrical metallic container for realizing an airtight inner space integral with and extending from one end said anode;

an output-side insulating tube having one end thereof airtightly connected to said cylindrical metallic container at a point spaced from said anode and having the other end thereof extending outwardly of said container;

an antenna conductor electrically coupled with one of said plurality of vanes and extending through the inner space



of said cylindrical metallic container and through said output-side insulating tube; and

choke means for suppressing a higher harmonic of said fundamental frequency comprising an annular extension of length (d) of said cylindrical metallic body and having a free end thereof extending within said output-side insulating tube and surrounding said antenna conductor and spaced therefrom, the length (d) of said annular extension being greater than a distance between said other end of said output-side insulating tube and said other end of said annular extension.

5,180,947

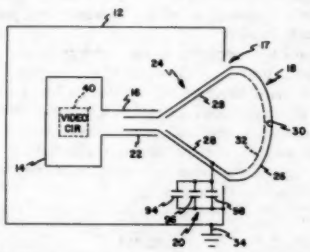
SHIELDED CATHODE RAY TUBE

Terrence M. McGill, Stevensville, Md., assignor to Alliant Techsystems Inc., Edina, Minn.

Filed Apr. 23, 1991, Ser. No. 689,966

Int. Cl.[5] H01J *1/52*

U.S. Cl. 315—85 **28 Claims**



1. A shielded CRT, comprising:

a CRT having a display face and an internal conductive layer associated with said display face;

means for grounding said internal conductive layer; and

a shielded enclosure conductively coupled to said internal conductive layer to enclose said cathode ray tube, said display face of said CRT extending through an aperture of said shielded enclosure.

5,180,948

PLASMA GENERATOR WITH SECONDARY RADIATOR

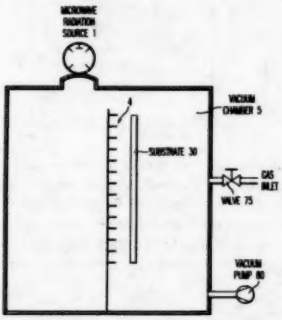
Michael Heinemann, Muenster; Bernhard Soeder, Seeheim-Jugenheim, and Wolfgang Meier, Muenster, all of Fed. Rep. of Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Feb. 28, 1992, Ser. No. 843,160

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1991, 9102438[U]

Int. Cl.[5] H05H *1/00*

U.S. Cl. 315—111.21 10 Claims



1. A low pressure plasma generator for subjecting a substrate to a plasma, comprising:

a vacuum chamber in which said substrate is located;

at least one microwave radiation source for generating microwaves which enter said vacuum chamber, wherein the microwave radiation source does not by itself produce a field strength sufficient to form plasma in the vacuum chamber;

at least one aerial acting as a secondary radiation source for the secondary radiation of microwaves in the vacuum chamber, wherein the secondary radiation of microwaves forms a plasma at a tip of the at least one aerial.

5,180,949

PLASMA GENERATOR

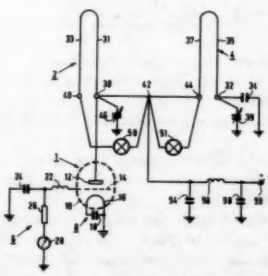
René C. Durr, Albertville, France, assignor to U.S. Philips Corp., New York, N.Y.

Filed Apr. 3, 1991, Ser. No. 679,974

Claims priority, application Netherlands, Apr. 6, 1990, 9000809

Int. Cl.[5] H05H *1/46*

U.S. Cl. 315—111.51 9 Claims



1. A plasma generator provided with an oscillator circuit having a tuned quarter-wave resonant system for generating a plasma discharge in an induction coil to be fed by the generator for heating an aerosol-containing material to be analyzed by means of a spectroscope, characterized in that active and passive quarter-wave conductors are subdivided by folding into a plurality of sections and for mutual balancing the active quarter-wave conductor is capacitively coupled to a high-frequency generator connected to ground potential.

5,180,950

POWER-FACTOR-CORRECTED ELECTRONIC BALLAST

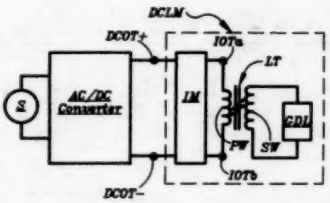
Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Continuation-in-part of Ser. No. 663,052, Feb. 27, 1991, which is a continuation of Ser. No. 517,472, May 2, 1990, abandoned, which is a continuation of Ser. No. 11,261, Feb. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 9,822, Feb. 2, 1987, Pat. No. 4,745,539, which is a continuation-in-part of Ser. No. 963,455, Dec. 1, 1986, Pat. No. 4,729,081. This application Jul. 29, 1991, Ser. No. 737,394

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[5] H05B *37/00*

U.S. Cl. 315—127 25 Claims



1. In an electronic ballast means for a gas discharge lamp, the combination comprising:

first means operable to connect with the relatively low frequency voltage of an ordinary electric utility power line and, when so connected, conditionally operative to provide a relatively high frequency AC voltage at an AC output; the first means having control means operative, during any period when receiving a control action, to prevent the first means from providing the relatively high frequency AC voltage;

second means connected in circuit between the AC output and a DC output; the second means being operative to provide a unidirectional current to an energy-storing capacitor means connected with the DC output; a DC voltage being thereby provided at this DC output; and

third means connected between the DC output and the control means and operative to provide said control action whenever the magnitude of the DC voltage exceeds a predetermined level.

5,180,951

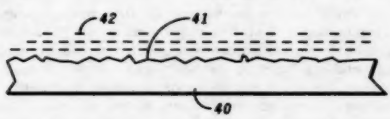
ELECTRON DEVICE ELECTRON SOURCE INCLUDING A POLYCRYSTALLINE DIAMOND

Lawrence N. Dworsky; James E. Jaskie, and Robert C. Kane, all of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 5, 1992, Ser. No. 831,592

Int. Cl.[5] H05B *41/00*

U.S. Cl. 315—169.3 20 Claims



1. An electron device electron source comprising a polycrystalline diamond film having a surface including a plurality

of crystallographic planes some of which exhibit an inherent affinity to retain electrons disposed at/near the surface which is less than 1.0 electron volt.

5,180,952

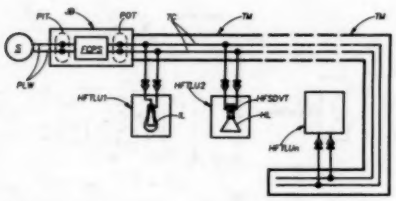
ELECTRONIC TRACK LIGHTING SYSTEM

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Continuation of Ser. No. 611,334, Nov. 13, 1990, abandoned, which is a continuation of Ser. No. 484,278, Feb. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 387,370, Jul. 31, 1989, abandoned, which is a continuation of Ser. No. 108,963, Oct. 16, 1987, abandoned, which is a continuation of Ser. No. 741,132, Jun. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 667,691, Nov. 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 487,817, Apr. 22, 1983, Pat. No. 4,506,318. This application Feb. 7, 1992, Ser. No. 831,086

Int. Cl.[5] H05B *37/00, 39/00, 41/26*

U.S. Cl. 315—210 **13 Claims**



1. An arrangement comprising:

a source providing a power line voltage between a first and a second power line terminal;

a power track having a first and a second track conductor; the power track being operative to receive and hold a number of track lighting units; each one track lighting unit having a pair of load terminals; which load terminals, when the one track lighting unit has been received and is indeed being held by the power track, make electrical connection with the track conductors; and

voltage conditioner means connected in circuit between the power line terminals and the track conductors; the voltage conditioner means being operative to convert the power line voltage provided between the power line terminals to a track voltage provided betweeen the track conductors; there being, through the voltage conditioner means, an electrical conduction path between the first track conductor and one of the power line terminals; the fundamental frequency of the track voltage being substantially higher than that of the power line voltage.

5,180,953

STROBO DEVICE

Shinji Hirata, Toyonaka, and Kazuo Tanaka, Neyagawa, both of Japan, assignors to West Electric Co., Ltd., Osaka, Japan

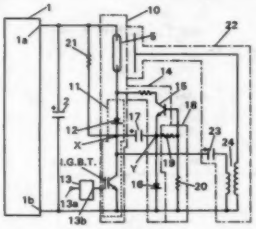
Filed Nov. 26, 1991, Ser. No. 799,459

Claims priority, application Japan, Nov. 26, 1990, 2-323570; Jan. 24, 1991, 3-7020; Aug. 14, 1991, 3-204191; Aug. 30, 1991, 3-219894; Aug. 30, 1991, 3-219896

Int. Cl.[5] G03B *15/00*

U.S. Cl. 315—241 S **22 Claims**

1. A strobo device, comprising a DC high voltage power supply, a main capacitor which is connected to both ends of the DC high voltage power supply, first series connection elements having a flash discharge tube, a first diode and an insulated gate bipolar transistor connected in series, connected to both ends of the main capacitor and forming a discharge passage of the main capacitor via the flash discharge tube, second series connection elements having a control switch element with a control polarity and a second diode connected in series and connected to both ends of series elements of the first diode and the insulated gate bipolar transistor, a step-up capacitor connected between a cathode of the first diode and an anode of the second diode, a charge means for charging the step-up capacitor so as to give a high voltage to a terminal on the side connected to a cathode of the flash discharge tube, a gate means for actuating an on action of the control switch element in response to a flash start signal, a drive control means



for turning on the insulated gate bipolar transistor by supplying an on voltage to the control polarity of the insulated gate bipolar transistor in response to a flash start signal and turn off the insulated gate bipolar transistor by stopping the supplying of the on voltage in response to a flash stop signal, and a trigger circuit by which the flash discharge tube is excited.

5,180,954

METHOD AND APPARATUS FOR CONTROLLING A SEWING MACHINE

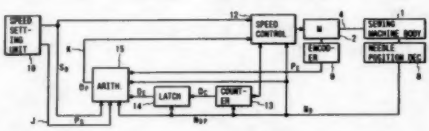
Takayuki Wakana, and Satomi Yamauchi, both of Aichi, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jan. 4, 1991, Ser. No. 637,584

Claims priority, application Japan, Jan. 8, 1990, 2-1178

Int. Cl.[5] H02P *5/00*

U.S. Cl. 318—369 **16 Claims**



1. A sewing machine control apparatus for controlling the speed of a sewing machine which is rotated by an electric motor comprising:

speed detecting means for detecting a speed of said electric motor;

needle position detecting means for detecting a needle position of said sewing machine to provide a needle position detection signal;

arithmetic means for performing an arithmetic operation to obtain a rotation transfer ratio in accordance with said needle position detection signal and an output signal of said speed detecting means;

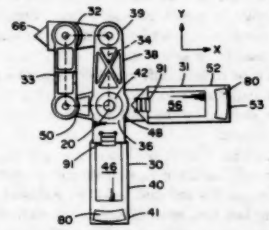
means for controlling a start time of the arithmetic operation of said arithmetic means; and

a control section for controlling the speed of said electric motor according to a result of the arithmetic operation of said arithmetic means.

5,180,955
POSITIONING APPARATUS

John P. Karidis, Ossining; Gerard McVicker, Wappingers Falls, and Joseph P. Pawletko, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armork, N.Y.

Filed Oct. 11, 1990, Ser. No. 596,111
Int. Cl.[5] B25J 9/14
U.S. Cl. 318—568.10 25 Claims



1. A high speed mini-positioner comprising:

a positioning linkage having a changeable parallelogram structure and a base structure, said parallelogram structure having four arms forming a general parallelogram profile with first and second arms pivotally connected to each other by a center shaft at intermediate locations and each having a first section with a first end and a second section with a second end on opposite sides of said center shaft and, third and fourth arms pivotally connected to each other proximate first ends thereof and having second ends pivotally connected to said first and second arm second ends, said center shaft being connected to said base structure such that movement of said first and second arm first ends change said general parallelogram profile and move an end-effector proximate said third and fourth arm first ends to a new position; and

means for moving said linkage comprising said first and second arm first sections each having an electromagnetic coil and said base structure having magnets located on opposite sides of said coils and stationary iron structures passing through each coil such that a stationary magnetic field passes through said coils and, upon energizing said coils a lateral magnetic force on the first and second arm first sections move said first and second arms to change the shape of said general parallelogram profile and move said end-effector to a new location.

5,180,956
ADAPTABILITY CONTROLLER FOR ROBOTS

Junji Oaki, Tokyo; Shuichi Adachi, Kanagawa; Yutaka Iino, Kanagawa, and Takashi Shigemasa, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 25, 1991, Ser. No. 647,032
Claims priority, application Japan, Mar. 30, 1990, 2-81203
Int. Cl.[5] G05B 19/42
U.S. Cl. 318—568.11 5 Claims

1. An adaptive controller for driving an actuator of a robot arm under servo control where a servo constant is set such that the robot arm follows a predetermined reference movement orbit, comprising:

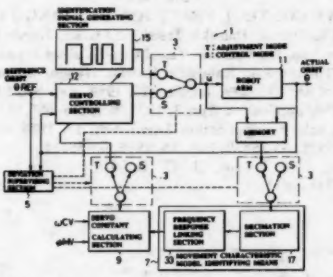
(a) switching means for switching between an adjustment mode where the servo constant is adjusted and a servo control mode where the servo constant is already set;

(b) a deviation supervising section for obtaining a deviation between an orbit of the robot arm in actual operation and a reference movement orbit thereof, and for operating the switching means to change from the servo control mode into the servo adjustment mode when the deviation exceeds a predetermined value;

(c) dynamic-characteristic-model identifying means for identifying a movement characteristic of the robot arm when the servo control mode is changed into the servo adjustment mode by the deviation supervising section and the switching means, wherein the dynamic-characteristic-model identifying means comprises

a signal generating section for generating a signal for identification over a wide frequency region.

a decimation section for sampling input and output signals obtained when the robot arm is operated by an identification signal generated from the signal generating section, and for dividing the sampled input and output signals into a plurality of frequency regions by a plurality of low-pass filters, resampling the divided input and output signals



with thinning out at cycles corresponding to the plurality of frequency regions, and identifying frequency responses corresponding to the frequency regions by processing the resampled input and output signals based on the method of least squares, and

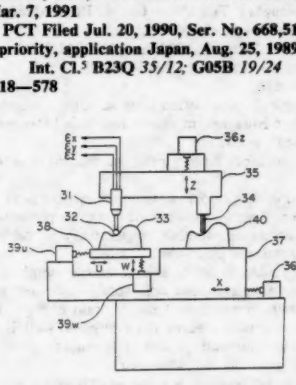
a frequency response linking section for linking the frequency responses identified by the decimation section so as to obtain a frequency response over a wide frequency range; and

(d) a servo constant calculating section for calculating a new servo constant for reducing the deviation obtained by the deviation supervising section based on the identification result from the frequency response linking section means.

5,180,957
TRACING CONTROL SYSTEM

Hitoshi Matsuura, Hachioji, and Hitoshi Aramaki, Hino, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP90/00938, § 371 Date Mar. 25, 1991, § 102(e) Date Mar. 25, 1991, PCT Pub. No. WO91/02624, PCT Pub. Date Mar. 7, 1991
PCT Filed Jul. 20, 1990, Ser. No. 668,516
Claims priority, application Japan, Aug. 25, 1989, 1-219832
Int. Cl.[5] B23Q 35/12; G05B 19/24
U.S. Cl. 318—578 3 Claims



1. A tracing control system for machining a workpiece through tracing by calculating speed command values of respective axes, using change amounts detected by a tracer head,

by moving a cutter relative to the workpiece through a control of the speed of the respective axes in accordance with the speed command values and by moving the tracer head along the surface of a model, comprising:

calculating means for calculating predetermined values in proportion to the amounts of change in the speed command values of the respective axes;

a main table; and

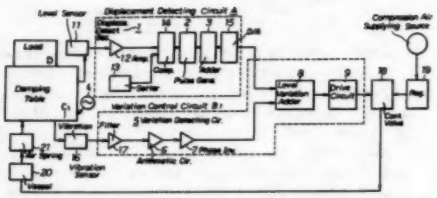
a sub-table provided on said main table for moving only the model in parallel with the respective axes, said sub-table driven by sub-motors instructed by amounts corresponding to respective ones of the predetermined values.

5,180,958

ACTIVE CONTROL PRECISION DAMPING TABLE

Hitoshi Choshitani, Ibaraki; Takahide Osaka, Itami; Fumiaki Itojima, Yao, and Masashi Yasuda, Suita, all of Japan, assignors to Tokkyo Kiki Kabushiki Kaisha, Hyogo, Japan

Division of Ser. No. 299,586, Jan. 23, 1989, Pat. No. 5,060,519.
This application Apr. 3, 1991, Ser. No. 680,173
Claims priority, application Japan, Feb. 18, 1988, 63-35829; Feb. 18, 1988, 63-35830; Feb. 18, 1988, 63-35831
Int. Cl.[5] G05B *5/01*
U.S. Cl. 318—623 **3 Claims**



3. A variation control circuit comprising: a sensor for detecting displacement of an object, said sensor outputting a displacement signal and a vibration signal resulting from vibrations of the object; a phase inverter for inverting phase of the vibration signal 180 degrees; an adder for carrying out an adding operation on said displacement signal and said inverted vibration signal and outputting a variation signal; and a drive circuit for generating a drive signal in response to the variation signal received from the adder.

5,180,959

ELECTRICALLY CONTROLLED SHIFT ACTUATOR

Gary L. Christopher, Fox River Grove, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 8, 1991, Ser. No. 742,790
Int. Cl.[5] B60K *20/02*
U.S. Cl. 318—626 **10 Claims**

1. An electrically controlled shift actuator comprising:

shift member engagement means movable between first and second shift position;

a rotatable member having first and second rotational positions;

means for moving said first member engagement means to said first and second shift positions in response to rotation of said rotatable member respectively to said first and second rotaional positions;

a motor operable to rotate said rotatable member;

energy dissipating means connectable to said motor for dynamically braking said motor, said energy dissipating means comprising electrically energized switch means for selectively connecting and disconnecting said energy dissipating means to said motor;

first and second position sensing switch means for sensing a respective rotational position of said rotatable member, each said position sensing switch means having first and second conditions, respectively, each said position sensing switch means connected to said motor in respective said second conditions thereof and to said electrically energized switch means in respective said first conditions thereof;

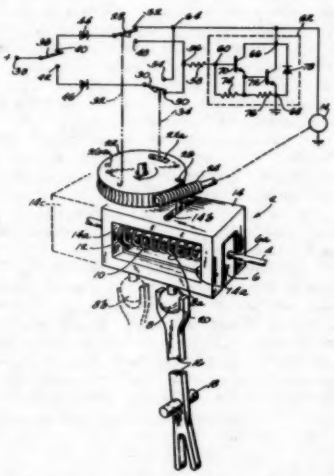
selector switch means connected to each said position sensing switch means and to a power supply for selectively alternatively connecting one of said first and said second position sensing switch means to said power supply; and

means associated with said rotatable member for

a) effecting said second condition of said first position sensing switch means and said first condition of said second position sensing switch means in said first rotational position of said rotatable member and said first shift position of said shift member engagement means to connect said motor to said power supply through said selector switch means and said first position sensing switch means,

b) changing said second position sensing switch means to said second condition as said motor rotates said rotatable member toward said second rotational position,

c) changing said first position sensing switch means to said first condition at said second rotational position of said



rotatable member to disconnect power from said motor and to connect power to said electrically energizable switch means, thereby connecting said energy dissipating means to said motor,

d) connecting said motor to said power supply through said second position sensing switch means upon changing said selector switch means to an alternative condition when said shift member engagement means is in said second shift position, disconnecting power from said electrically energizable switch means, thereby disconnecting said energy dissipating means from said motor,

e) changing said first position sensing switch means to said second condition as said motor rotates said rotatable member toward said first rotational position,

f) changing said second position sensing switch means to said first condition at said first rotational position of said rotatable member to disconnect power from said motor and to connect power to said electrically energizable switch means, connecting said energy dissipating means to said motor, wherein simultaneous application of power to said motor and said electrically energizable switch means is prevented.

5,180,960

CIRCUIT ARRANGEMENT FOR COMMUTATING A RELUCTANCE MOTOR

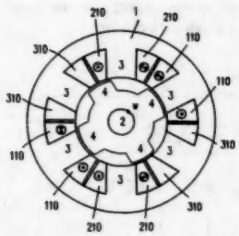
Ralf Austermann, Herzogenrath-Kohlscheid, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 18, 1991, Ser. No. 732,367

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1990, 4025350

Int. Cl.[5] H02P *8/00*

U.S. Cl. 318—701 **26 Claims**



1. A circuit arrangement for driving a reluctance motor comprising:

a rotor movable relative to a stator having at least a first winding section, a second winding section and a third winding section sequentially arranged along a path in the direction of rotor motion, each winding section positioned along the path substantially equidistant from two other winding sections;

commutation means for sequentially supplying based on switching means a substantially constant current to each of the winding sections; and

detecting means for detecting a voltage in the first winding section induced by current flowing in the second winding section based on mutual inductance between the first winding section and the second winding section;

wherein said switching means is operable for terminating the substantially constant current supply from the commutation means to the second winding section and for initiating the substantially constant current supply from the commutation means to the third winding section based on the detected induced voltage in the first winding section.

5,180,961

BATTERY CHARGING APPARATUS

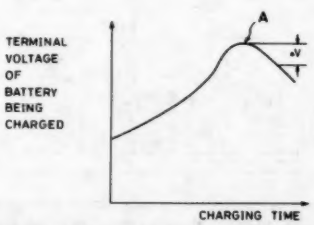
Kazuhiro Tsujino, Osaka, Japan, assignor to Sanyo, Electric Co., Ltd., Osaka, Japan

Filed Nov. 8, 1989, Ser. No. 434,131

Claims priority, application Japan, Nov. 11, 1988, 63-286059

Int. Cl.[5] H02J *7/00*

U.S. Cl. 320—20 **13 Claims**



1. A battery charging apparatus, comprising:

sampling means for sampling a terminal voltage of a battery being charged at time intervals:

storing means for storing a maximum sampled value;

outputting means for outputting a full-charge signal when a new sampled value is smaller than the maximum sampled value by a predetermined value or more; and

updating means for updating the maximum sampled value of said storing means when a condition where said new sampled value is larger than said maximum sampled value continues for a predetermined time or more.

5,180,962

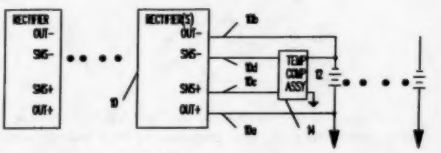
APPARATUS FOR TEMPERATURE COMPENSATING ONE OR MORE BATTERY CHARGERS

James A. Giancaterino, Sheffield Lake, and Bruce Walsh, Avon, both of Ohio, assignors to Reliance Comm/Tec Corporation, Lorain, Ohio

Filed Jul. 16, 1990, Ser. No. 553,228

Int. Cl.[5] H02J *7/04*

U.S. Cl. 320—35 **18 Claims**



1. An apparatus for causing a float voltage of one or more battery chargers to change so as to compensate for changes in temperature of one or more batteries connected to said one or more chargers, each of said one or more batteries having similar temperature compensation curves, said apparatus connected between sense terminals of said one or more chargers and battery terminals of said one or more batteries, said apparatus comprising:

a) a circuit comprising:

i) means having an impedance which changes with changes in ambient temperature, said means having an ambient temperature which is essentially the same as said ambient temperature of said one or more batteries;

ii) means having a constant impedance, said constant impedance means and said ambient temperature impedance changing means forming a voltage divider for providing from a fixed reference voltage a variable voltage whose amplitude is a linear approximation to temperature compensation curves of said one or more batteries; and

iii) means responsive to said amplitude of said variable voltage for providing between said sense terminals and said battery terminals a voltage whose amplitude causes each of said one or more chargers to change to float voltage to compensate for ambient temperature changes of said one or more batteries and,

b) a housing comprising:

i) a case, said circuit residing in said case; and

ii) a conductive baseplate attached to said case, said baseplate at essentially said ambient temperature of said one or more batteries, said ambient temperature impedance changing means essentially assuming the ambient temperature of said baseplate.

5,180,963

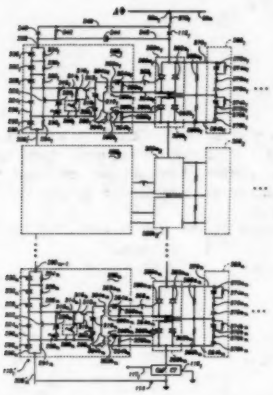
OPTICALLY TRIGGERED HIGH VOLTAGE SWITCH NETWORK AND METHOD FOR SWITCHING A HIGH VOLTAGE

Mohamed A. El-Sharkawi, Renton; George Andexler, Everett, and Lee I. Silberkleit, Mountlake Terrace, all of Wash., assignors to Board of Regents of the University of Washington, Seattle, Wash.

Continuation-in-part of Ser. No. 665,774, Mar. 7, 1991, which is a continuation-in-part of Ser. No. 543,118, Jun. 22, 1990, abandoned. This application May 9, 1991, Ser. No. 697,673

Int. Cl.[5] G05F *1/70*

U.S. Cl. 323—211 **26 Claims**



1. An optically triggered solid state switch, comprising:

(a) energy storage means, connectable to a voltage source that varies periodically by cycling between positive and negative potentials, for conveying an electrical current and for storing an electrical charge resulting from the electrical current while the voltage source is at one of the positive and negative potentials;

(b) transformer means, connected generally in parallel with the energy storage means, for producing a trigger pulse in response to a pulse of electrical current flowing through the transformer means from the electrical charge stored by the energy means;

(c) light sensitive switch means, connected generally between the energy storage means and the transformer means, for controllably discharging the electrical charge stored by the energy storage means in response to a pulse of light, thereby producing the pulse of electrical current flowing through the transformer means; and

(d) triggered switch means, connected to the transformer means, for providing a conductive path for an electrical current to flow in respect to the voltage source as the voltage source cycles through substantially a zero potential across the triggered switch means, in response to the trigger pulse.

5,180,964

ZERO-VOLTAGE SWITCHED FM-PWM CONVERTER

Gerald D. Ewing, 800 Palm Ave., Seaside, Calif. 93955

Continuation of Ser. No. 500,817, Mar. 28, 1990, abandoned. This application Jul. 22, 1991, Ser. No. 734,066

Int. Cl.[5] G05F *1/613*

U.S. Cl. 323—222 **13 Claims**

1. A zero-voltage switched FM-PWM regulated D-C to D-C converter circuit having an unregulated input line and a regulated output line, said converter circuit operatively connectable to a controller which controls the regulation and zero-voltage switching of said converter circuit, said converter circuit comprising:

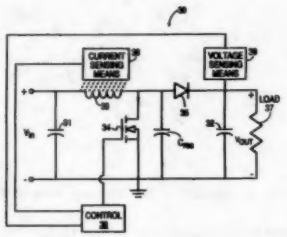
an input filter capacitor to filter input voltage from said input line;

a first inductor coupled to receive input current from said input capacitor and said input line;

an output filter capacitor;

a diode;

a switching means coupled to said first inductor and having a conducting state and non-conducting state, said switching means for controlling the transfer of power from said first inductor to the output line and to said output filter capacitor through said diode;



a discrete capacitor connected directly across the switching means to reduce turn-off transient power dissipation in the switching means;

a current sensing means coupled to said first inductor to provide a signal indicative of the current flowing through said first inductor used to cause the controller to turn on the switching means when essentially a zero voltage is present across sad switching means; and

a voltage to provide a signal to cause the controller to control the switching means conduction on-time and switching frequency to maintain the output line voltage essentially constant;

wherein said converter circuit is non-resonant.

5,180,965

DIRECT-CURRENT POWER SOURCE CIRCUIT WITH BACK GATE CONTROL CIRCUIT FOR POWER MOS-FET

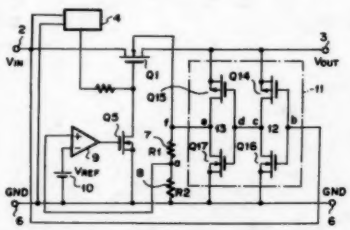
Tadashi Nose, Shiga, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 24, 1991, Ser. No. 782,318

Claims priority, application Japan, Oct. 25, 1990, 2-290067

Int. Cl.[5] G05F *1/565*

U.S. Cl. 323—275 **4 Claims**



1. A direct current power source circuit having an input terminal, an output terminal and a ground terminal, said circuit comprising:

a voltage control power MOS-FET as a series control device provided between said input terminal and said output terminal of the circuit, and

a back gate control circuit which is connected to a back gate

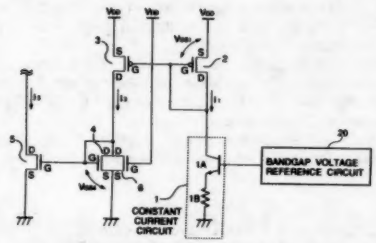
of said power MOS-FET and which controls a back gate voltage for causing a parasitic diode between a source and a drain of said power MOS-FET to become a non-conductive state when an input voltage applied to said input terminal becomes a low level.

5,180,966

CURRENT MIRROR TYPE CONSTANT CURRENT SOURCE CIRCUIT HAVING LESS DEPENDENCE UPON SUPPLIED VOLTAGE

Michinori Sugawara, and Hiroyuki Takahashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 22, 1991, Ser. No. 748,994
Claims priority, application Japan, Aug. 22, 1990, 2-220204
Int. Cl.[5] G05F *5/08, 3/26*
U.S. Cl. 323—308 5 Claims



1. A current mirror type constant current source circuit comprising:

a current mirror circuit composed of first and second MOS transistors of a first conduction type connected to form a first current mirror, a source-drain path of said first MOS transistor forming an input current path of said current mirror circuit, and a source-drain path of said second MOS transistor forming an output current path of said current mirror circuit,

a current source connected between an input end of said input current path of said current mirror circuit and a voltage supply line, and

a third MOS transistor of said first conduction type having a source and a drain connected to a source and a drain of said first MOS transistor, respectively, a gate of said third MOS transistor being connected to said voltage supply line,

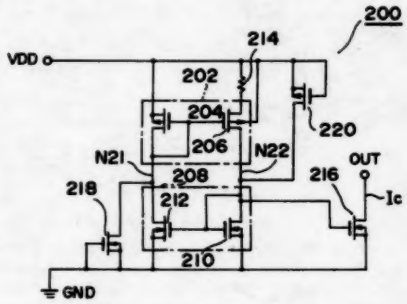
and wherein said current source includes a second current mirror circuit having fourth and fifth MOS transistors which are of a second conduction type opposite to said first conduction type connected to form a second current mirror, a source-drain path of said fourth MOS transistor forming an output current path of said second current mirror circuit and being connected between said input end of said input current path of said first current mirror circuit and said voltage supply line, and a gate of said fourth MOS transistor being connected to a gate of said fifth MOS transistor, a source-drain path of said fifth MOS transistor forming an input current path of said second current mirror circuit and being connected through a second current source between said high voltage supply line and said ground.

5,180,967

CONSTANT-CURRENT SOURCE CIRCUIT HAVING A MOS TRANSISTOR PASSING OFF-HEAT CURRENT

Seiichi Yamazaki, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1991, Ser. No. 748,661
Claims priority, application Japan, Aug. 3, 1990, 2-229293
Int. Cl.[5] G05F *3/08*
U.S. Cl. 323—315 23 Claims



1. A constant-current source circuit having a MOS transistor passing off-leak current comprising:

(a) a first fixed voltage terminal having a first voltage level;

(b) a second fixed voltage terminal having a second voltage level;

(c) an output terminal coupled to output a constant current;

(d) first and second nodes;

(e) a first current mirror circuit electrically coupled between the first fixed voltage terminal and said first and second nodes, and having a first current gain, said first current mirror circuit having a first current path passing a first current from said first fixed voltage terminal to said first node and a second current path passing a second current from said first fixed voltage terminal to said second node in accordance with the first current gain;

(f) a second current mirror circuit electrically coupled between the second fixed voltage terminal and said first and second nodes, and having a second current gain, said second current mirror circuit having a third current path passing a third current from said second node to said second fixed voltage terminal and a fourth current path passing a fourth current in accordance with the second current gain;

(g) a current gain variation resistor coupled between the fourth current path and said second fixed voltage terminal, for controlling the fourth current to control the second current gain;

(h) a first MOS transistor having a first conductivity type and passing a first off-leak current from said first fixed voltage terminal to said second node, the first MOS transistor including

(1) a first gate electrode to which a predetermined voltage level is applied so as to keep the first MOS transistor in the off state,

(2) a first electrode coupled to said first fixed voltage terminal, and

(3) a second electrode coupled to said second node; and

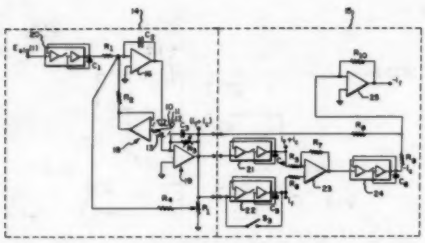
(i) an outputting circuit coupled between the output terminal and the first fixed voltage terminal, said outputting circuit having a control terminal coupled to the first current mirror circuit, for providing the constant current to the output terminal.

5,180,968

METHOD AND APPARATUS FOR COMPENSATION OF DOUBLE LAYER CHARGING CURRENT IN ELECTROCHEMICAL CELLS

Stanley Bruckenstein, Amherst, and Nancy Adinolfe, Pleasant Valley, both of N.Y., assignors to Research Foundation of State University of New York, Albany, N.Y.

Filed Mar. 1, 1991, Ser. No. 665,607
Int. Cl.[5] G01N *27/00*
U.S. Cl. 324—71.1 9 Claims



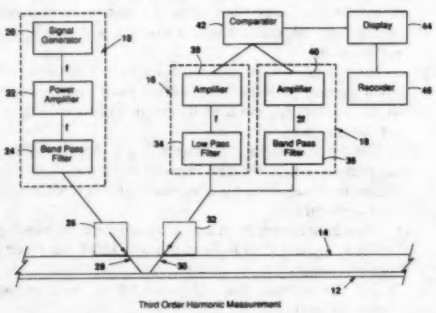
1. In an electrochemical cell having a reference electrode and, a working electrode and also having a time-varying potential difference applied between said electrodes, a method of measuring faradaic current at said working electrode, comprising interrupting said time-varying potential difference and temporarily applying a constant potential difference across said electrodes and measuring a current at said working electrode while said constant potential difference is applied, wherein said measured current is the faradaic current at said working electrode.

5,180,969

DETECTION OF REINFORCING STEEL CORROSION IN CONCRETE STRUCTURES USING NON-LINEAR HARMONIC AND INTERMODULATION WAVE GENERATION

Hegeon Kwun, San Antonio; Gary L. Burkhardt, Adkins, and Jay L. Fisher, San Antonio, all of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Feb. 4, 1992, Ser. No. 830,702
Int. Cl.[5] G01N *27/00*
U.S. Cl. 324—71.2 12 Claims



1. A method of detecting corrosion on an electrically conductive member that is surrounded by an electrically non-conductive material and is unavailable to visual inspection, comprising the steps of:

transmitting a first electromagnetic signal through said electrically non-conductive material so as to illuminate said electrically conductive member, said first electromagnetic signal having at least one fundamental frequency;

receiving a reflected/generated electromagnetic signal from said electrically conductive member within said electrically non-conductive material, said reflected/generated electromagnetic signal comprising a reflected component made of said fundamental frequency and a generated component made of a plurality of harmonic and intermodulated frequencies of said fundamental frequency, said harmonics and intermodulated frequencies being ten rated by non-linear electrical characteristics attributable to said corrosion of said electrically conductive member, said step of receiving said signal comprising the steps of:

positioning a receiver so as to intercept said reflected/-generated electromagnetic signal from said electrically conductive member within said electrically non-conductive material;

filtering said reflected/generated electromagnetic signal with a band pass filter and with a low pass filter so as to separate said reflected component made of said fundamental frequency from said generated component made of said plurality of harmonic and intermodulated frequencies;

amplifying said reflected component of said reflected/-generated electromagnetic signal at said fundamental frequency with an electronic power amplifier; and

amplifying said generated component of said reflected/-generated electromagnetic signal at said at said plurality of harmonic and intermodulated frequencies with an electronic power amplifier; and

determining a relative amplitude of said generated component of said reflected/generated electromagnetic signal in relation to said reflected component of said reflected/-generated electromagnetic signal;

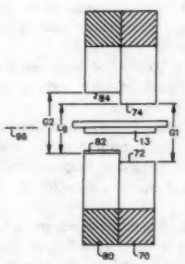
wherein said reflective amplitude is indicative of a degree of said corrosion in said electrically conductive member.

5,180,970

MECHANICALLY ADJUSTABLE CURRENT SENSOR AND METHOD FOR MAKING SAME

Gordon F. Ross, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 10, 1992, Ser. No. 833,286
Int. Cl.[5] G01R *33/00*
U.S. Cl. 324—117 H 8 Claims



1. A current sensor, comprising:

a first lamina having a first gap formed in its circumferential length, said first gap being defined by first and second opposing faces which are spaced apart by a first preselected distance, said first lamina having a first planar surface;

a second lamina having a second gap formed in its circumferential length, said second gap being defined by third and fourth opposing faces which are spaced apart by a second preselected distance, said second lamina having a second planar surface, said first and second laminae being associated together with said first and second planar surfaces disposed in contact with each other, said first and second

laminae defining a central opening shaped to permit an electrical conductor to extend therethrough; and

a magnetically sensitive device disposed in a space defined by said first and second gaps, said magnetically sensitive device being disposed between said first and second opposing faces and between said third and fourth opposing faces, said magnetically sensitive device having an output signal which varies as a function of magnetic flux density in said space defined by said first and second gaps, said magnetic flux density being a function of an electric current flowing through said central opening in said conductor and the size of said space defined by said first and second gaps, said first lamina being disposed relative to said second lamina to misalign said first and third faces by a predetermined distance which is determined as a function of the relationship between said current and said output signal.

5,180,971

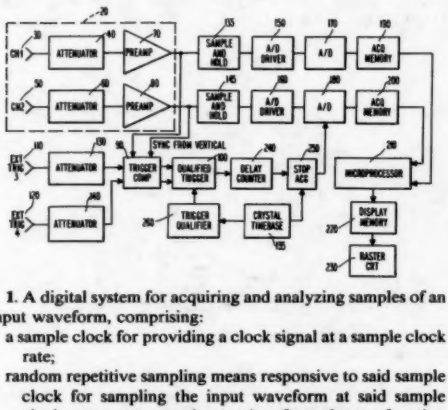
METHOD AND APPARATUS FOR INCREASING THROUGHPUT IN RANDOM REPETITIVE DIGITIZING SYSTEMS

B. Allen Montijo, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 487,685, Mar. 2, 1990. This application Jun. 17, 1991, Ser. No. 716,460

Int. Cl.[5] G01R *13/20*

U.S. Cl. 324—121 R **17 Claims**



1. A digital system for acquiring and analyzing samples of an input waveform, comprising:

a sample clock for providing a clock signal at a sample clock rate;

random repetitive sampling means responsive to said sample clock for sampling the input waveform at said sample clock rate so as to acquire a series of samples as a function of time;

triggering means for providing trigger signals relating said series of samples to a known trigger event for display;

trigger qualifier means responsive to said sample clock for creating a trigger qualifying time window with respect to each of said trigger signals within each period of said clock signal;

data acquisition control means responsive to said trigger qualifier means for stopping data acquisition by said sampling means in response to trigger signals from said triggering means during said trigger qualifying time window once a sample has been acquired;

means for analyzing said series of samples from said sampling means, said series of samples including only those samples acquired for trigger signals which occurred during said trigger qualifying time window; and

means for displaying the analyzed samples.

5,180,972

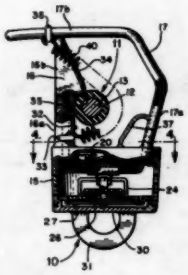
HOUSING INCLUDING BIASING SPRINGS EXTENDING BETWEEN CLAMP ARMS FOR CABLE MOUNTED POWER LINE MONITORING DEVICE

Edmund O. Schweitzer, Jr., 2433 Center St., Northbrook, Ill. 60062

Filed Jan. 31, 1992, Ser. No. 828,428

Int. Cl.[5] G01R *31/02, 19/165, 1/04*

U.S. Cl. 324—127 **14 Claims**



1. A housing for mounting a circuit condition monitoring device on and in operative relationship with a monitored electrical cable, comprising:

a body member adapted to house at least a sensing portion of the condition monitoring device;

a first clamp arm projecting a finite distance from said body member in a direction generally perpendicular to the axis of the cable;

a second clamp arm having a initial proximate portion projecting from said body member generally parallel-spaced from said first clamp arm, and a distal end portion entending generally perpendicular to and across the end of said first clamp arm;

said clamp arms and body member being dimensioned to encircle said cable;

said first clamp arm including between an initial proximate portion and a distal end portion cable indexing means on the inside surface thereof for positioning the cable along said first clamp arm in spaced relationship to said body member; and

biasing means extending between said first and second clamp arms for forcing the cable into engagement with said indexing means.

5,180,973

SELF-CALIBRATING CRT MEASURING INSTRUMENT

Gerardus N. A. Hoogendijk, Almelo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 21, 1991, Ser. No. 748,122

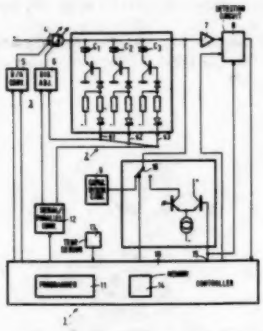
Claims priority, application Netherlands, Aug. 20, 1990, 9001842

Int. Cl.[5] G01R *15/10, 13/20*

U.S. Cl. 324—130 **8 Claims**

1. A self-calibrating measuring instrument having a calibration state and operational states and comprising; a display system for displaying an input signal and controlled by a time base circuit, wherein the time base circuit comprises a digitally adjustable integrator for generating sawtooth voltages with different slopes corresponding to different operational states of the display system, a programmed means which, in the calibration state, drives the digitally adjustable integrator with a calibration signal for the various operational states such that the time base circuit is calibrated for each operational state, an output of the time base circuit being coupled to a detection circuit for detecting whether the time base circuit is calibrated in an operational state thereby to derive a status signal which is supplied to the programmed means and which indicates whether the time base circuit has been calibrated, digital stor-

age means for storing calibration values determined in the calibration state, and wherein during normal operation of the



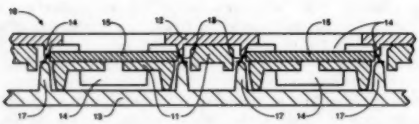
measuring instrument, the programmed means drive the integrator with the relevant calibration values for the corresponding operational states.

5,180,974

SEMICONDUCTOR TESTING AND SHIPPING SYSTEM

Steven L. Mitchell, Boise, and Warren M. Farnworth, Nampa, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed May 26, 1992, Ser. No. 888,779
Int. Cl.[5] G01R *1/00*
U.S. Cl. 324—158 F 1 Claim



1. An integrated system for testing, marking, inspecting and shipping completed semiconductor parts, said system comprising:

a) a shipping tray of suitable, known shape, size and composition and designed to contain a plurality of standard encapsulated and singulated integrated circuit parts, having generally parallel top and bottom surfaces, appropriately and individually placed therein, in a known way, for ultimate shipping, with the exposed leads on opposing sides of said parts being aligned uniformly with those of adjoining parts in standard parallel, spaced and planar relationship to each other;

b) said tray having a plurality of uniform indexing openings located immediately adjacent to opposing sides of said parts not having leads extending therefrom,, to permit precise placement and indexing of a special shipping tray cover to be placed on top of said tray after the parts are put in said tray;

c) the special shipping tray cover being of similar composition and generally matching configuration with the shipping tray and having a plurality of uniform openings in said cover which allow easy access to each of the top surfaces of the parts, for marking and inspecting said parts, when appropriate, and access to the exposed leads of the parts, when the cover is placed on top of the tray;

d) said shipping tray cover having a first, top, generally flat surface and a second, bottom and generally parallel surface, with a plurality of uniformly shaped protrusions extending downward therefrom, located precisely and accurately to enter the indexing openings in the shipping tray and designed to hold down and secure precisely in place, from above, each of the plurality of integrated circuit parts which are resting in the shipping tray;

e) said shipping tray also having a typical fixed indexing key, of known design, on each of two adjacent sides and a typical adjustable indexing key, of known design, on each of two other adjacent sides of said tray, in order to removably and precisely and accurately and operably secure said tray upon an appropriate burn-in board, having matching indexing key slots appropriately located on the periphery of the burn-in board

f) said burn-in board having, on one end, multiple leads removably and operably attachable, in a known way, to the multiple leads of the plurality of integrated circuit parts and on the opposing end to an external power supply, of known design, to perform appropriate burn-in and tests upon the plurality of integrated circuit parts contained in the shipping tray and held precisely and accurately in position by the shipping tray cover, during such burn-in and testing; and

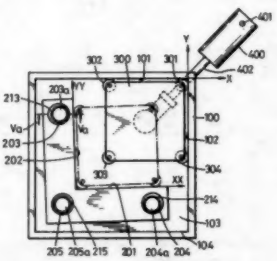
g) upon completion of standard marking, burn-in and testing, said special cover and burn-in board are removed from said shipping tray containing the integrated circuit parts and the tray is covered with a standard cover, stacked with other completed trays if appropriate and shipped.

5,180,975

POSITIONING DEVICE AND IC CONVEYOR UTILIZING THE SAME

Masakazu Andoh, and Shigenori Kawano, both of Gyoda, Japan, assignors to Advantest Corporation, Tokyo, Japan

Filed Nov. 14, 1990, Ser. No. 612,434
Claims priority, application Japan, Nov. 16, 1989, 1-298648
Int. Cl.[5] G01R *1/02;* B23Q *3/18;* F16H *53/06;* G05G *11/00*
U.S. Cl. 324—158 F 10 Claims



1. A positioning device comprising:

a base plate;

first cam means fixedly mounted on said base plate;

second cam means adjustably mounted on said base plate separate and spaced from said first cam means, said second cam means being disposed on said base plate so that translational and rotational angular positions of said second cam means are adjustable within a given limit relative to said first cam means;

fixing means for fixing said second cam means relative to said base plate in an adjusted position;

a movable block disposed between said first and second cam means;

drive means for selectively moving said block between first and second positions defined by said first and second cam means, respectively;

rollers mounted on said block; and

wherein said first and second cam means each contain wall surfaces whereby at least certain of said rollers contact said wall surfaces of said first cam means when said block is in said first position and at least certain of said rollers contact said wall surfaces of said second cam means when said block is in said second position.

5,180,976

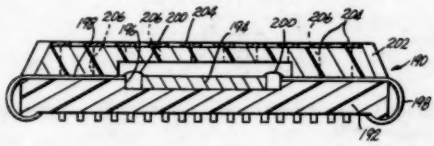
INTEGRATED CIRCUIT CARRIER HAVING BUILT-IN CIRCUIT VERIFICATION

David R. Van Loan, Diamond Bar; Charles J. Johnston, Walnut, and Mark A. Swart, Upland, all of Calif., assignors to Everett/Charles Contact Products, Inc., Pomona, Calif.

Division of Ser. No. 698,724, May 10, 1991, which is a continuation-in-part of Ser. No. 142,990, Jan. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 91,536, Aug. 31, 1987, abandoned, which is a continuation-in-part of Ser. No. 39,876, Apr. 17, 1987, abandoned. This application Sep. 9, 1991, Ser. No. 757,006

Int. Cl.[5] G01R *31/00*

U.S. Cl. 324—158 F 6 Claims



1. An integrated circuit carrier adapted to facilitate circuit verification by a test unit having an array of test probes for connection to a programmed circuit verification system, the integrated circuit carrier comprising:

an integrated circuit chip,

a rigid integral housing having an internal cavity containing the integrated circuit chip inside the housing, the housing further having a fixed upper surface with a length and a width,

a plurality of electrically separated leads extending outside the housing, each of said leads being connected to corresponding terminals of the integrated circuit inside the housing for electrically connecting circuits within the integrated circuit chip to corresponding leads on the carrier housing,

a plurality of electrically conductive test pads on the fixed upper surface of the carrier housing, the test pads being disposed thereon in fixed positions with respect to each other in a two-dimensional array in which the test pads are spaced-apart across the length and width of the fixed upper surface and thereby arranged for contact with individual test probes of said test unit; and

means within the carrier housing for electrically interconnecting individual ones of said leads with corresponding ones of said test pads so that exterior contact between the test probes and corresponding test pads is translated electrically, via the electrical interconnect means, to the individual leads on the carrier for use in verifying the continuity of electrical connections between circuits in the integrated circuit chip and the leads on the exterior of the integrated circuit carrier.

5,180,977

MEMBRANE PROBE CONTACT BUMP COMPLIANCY SYSTEM

Richard E. Huff, Belmont, Calif., assignor to Hoya Corporation USA, San Jose, Calif.

Filed Dec. 2, 1991, Ser. No. 801,702

Int. Cl.[5] G01R *1/06, 31/02*

U.S. Cl. 324—158 P 10 Claims

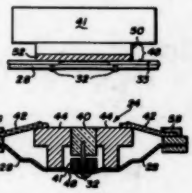
1. An integrated circuit (IC) testing system for nondestructively testing a wafer comprising:

a test controller capable of controlling and executing a set of test programs;

a wafer dispensing system for handling and positioning said wafer under the control of the test controller for performing said set of test programs;

a probe card including a performance board and a plurality of probes, the probe card cooperating with the wafer dispensing system positioning each of said plurality of probes engaging the wafer substantially at a predefined location with a controlled amount of force, said performance board being in electric communication and under control of the test controller and a transmission line corresponding to each of said probes;

said plurality of probes being affixed to said performance board wherein each of said probes is connected to said corresponding transmission line whereby each of said



probes is in electric communication with the test controller via said performance board; and

said probe card further including a probe compliancy system including at least one elastomer layer and at least one deflectable protection layer whereby said probe compliance system cushions said probes in engaging the wafer and said deflectable protection layers protects said elastomer layers.

5,180,978

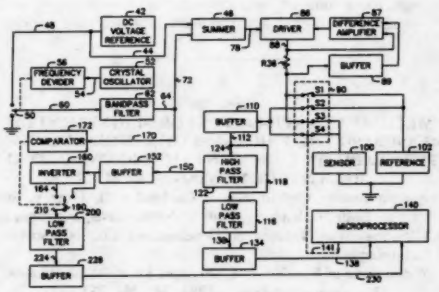
PROXIMITY SENSOR WITH REDUCED TEMPERATURE SENSITIVITY USING A.C. AND D.C. ENERGY

Stephen J. Postma, Freeport; Milford M. Gesin, Forreston, both of Ill.; Nick A. Demma, Minneapolis, Minn.; Paul E. Bjork, Forest Lake, Minn., and Thomas J. Wagener, Eden Prairie, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 2, 1991, Ser. No. 801,310

Int. Cl.[5] G01B *7/14*

U.S. Cl. 324—207.16 24 Claims



1. A proximity sensor, comprising:

a coil;

means for causing an alternating electrical current to flow through a winding of said coil;

first means, connected in signal communication with said winding, for measuring the DC resistance of said winding;

second means, connected in signal communication with said winding, for measuring the AC impedance of said winding; and

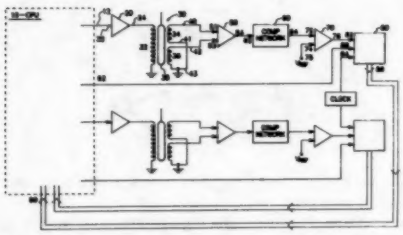
means, connected in signal communication with said first and second measuring means, for determining a distance between a metallic object and said coil as a function of said AC impedance and said DC resistance.

5,180,979

POSITION MEASUREMENT SENSOR USING A LINEAR VARIABLE DIFFERENTIAL TRANSFORMER WITH A TRIANGULAR PULSE INPUT AND OUTPUT

Ronald M. Frazzini, Plymouth, and Rick M. Solosky, Brooklyn Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 7, 1991, Ser. No. 772,401
Int. Cl.[5] G01B 7/14; G08C 19/06
U.S. Cl. 324—207.18 12 Claims



1. A position measurement device comprising:

a variable differential transformer having a primary coil, a secondary coil, and a movable core member, said secondary coil magnetically coupled with said primary coil by said movable core member, said movable core member also for attenuating a signal at said secondary in proportion to the position of said movable core member;

signal generation means for creating a triangular pulse and transmitting said triangular pulse to said variable differential transformer primary coil;

comparator means for comparing a voltage signal at said secondary coil with a reference voltage and producing an output signal, said output signal being at a first predefined voltage level when said secondary coil signal is smaller in magnitude than said reference voltage and said output voltage signal being at a second predefined voltage level when said output voltage signal is larger in magnitude than said reference voltage; and

counter means for measuring the time period between voltage transitions on said comparator means output and producing a digital signal indicative of said time period.

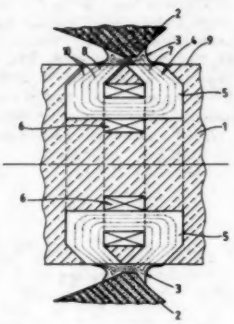
5,180,980

METHOD AND APPARATUS FOR MAGNETICALLY MEASURING THE THICKNESS OF A HIGH RELATIVE PERMEABILITY LUBRICANT FILM BETWEEN TWO RELATIVELY MOVING SURFACES

Alejandro Blond, Madrid, Spain; Gerhard Poll, Houten, and Vedran Tadic, Culemborg, both of Netherlands, assignors to SKF Industrial Trading & Development Co., Nieuwegein, Netherlands

Continuation of Ser. No. 508,120, Apr. 11, 1990, abandoned. This application Jun. 6, 1991, Ser. No. 711,127
Claims priority, application Netherlands, Apr. 14, 1989, 8900932
Int. Cl.[5] G01B 7/10; G01R 33/12
U.S. Cl. 324—229 6 Claims

1. A device for measuring the thickness of a lubricant film between two relatively moving surfaces, said lubricant film having magnetic permeability, said device mounted in one surface on one side of said lubricant film, said device comprising a magnetic core, an electrically energized coil wound about said core and producing magnetic flux in said core, said core having pole pieces bridged along one side by said lubricant film, the impedance of said coil changing as a function of the thickness of said lubricant film, said lubricant film having a much higher magnetic permeability than air, said one of said two surfaces is the casing surface of a shaft, said core has a



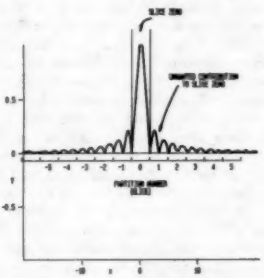
generally U-shaped cross-section, and said core is contained within said shaft.

5,180,981

METHOD FOR 3-D MAGNETIC RESONANCE IMAGING

David E. Purdy, East Winsor, N.J., assignor to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Nov. 21, 1990, Ser. No. 616,522
Int. Cl.[5] G01R 33/20
U.S. Cl. 324—309 5 Claims



1. A method for removing unwanted signal components acquired by applying a three dimensional magnetic resonance imaging pulse sequence to a sample, wherein signal acquisition is desired from a selected planar slice, but unwanted signal components are also acquired from a plurality of planar slices located outside the boundaries of said selected slice, said method comprising the following steps in the named order: p1 applying both a radio frequency saturation pre-pulse and a linear field gradient to said sample, which pre-pulse and field gradient create a comb-like pattern of planar nuclear magnetic saturation regions in said sample each of said regions being spatially positioned between a respective pair of contiguous planar slices; and

applying a 3-D imaging sequence to said sample, the timing of said application of the 3-D imaging sequence being such that the comb-like saturation pattern of said pre-pulse sequence is imposed upon said 3-D imaging sequence so as to reduce the acquisition of signal originating from said regions when acquiring signal from said selected slice.

5,180,982

PROBEHEAD FOR A NUCLEAR MAGNETIC RESONANCE SPECTROMETER

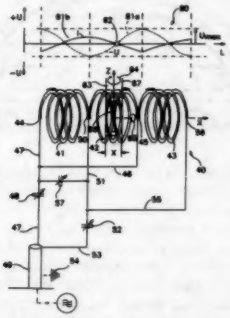
Heinz Zeiger, Waldbronn, Fed. Rep. of Germany, assignor to Bruker Analytische Messtechnik GmbH, Fed. Rep. of Germany

Filed Jun. 5, 1991, Ser. No. 710,563

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1990, 4018657

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—322 12 Claims



1. A probehead for a nuclear magnetic resonance spectrometer, comprising:

a coil structure defining a first axis and having

a first solenoid coil having a first terminal and a second terminal, and being wound in a first winding sense about said first axis;

a second solenoid coil adjacent said first solenoid coil and having a third terminal and a fourth terminal, and being wound in a second winding sense opposite said first winding sense about said first axis, said third terminal of said second solenoid coil being connected to said second terminal of said first solenoid coil in a first junction point, said second solenoid coil being, further, arranged symmetrically with respect to a central point of said first axis;

a third solenoid coil adjacent said second solenoid coil and having a fifth terminal and a sixth terminal, and being wound in said first winding sense about said first axis, said fifth terminal of said third solenoid coil being connected to said fourth terminal of said second coil in a second junction point;

high-frequency signal supply means having a high-frequency terminal and a ground terminal;

a first capacitor;

a first electrical line interconnecting said high-frequency terminal with a first electrode of said first capacitor;

a second electrical line interconnecting said first terminal of said first solenoid coil with a second electrode of said first capacitor;

a third electrical line interconnecting said first terminal of said first solenoid coil with said second junction point between said second and said third solenoid coils;

a second capacitor;

a fourth electrical line interconnecting said ground terminal with a first electrode of said second capacitor;

a fifth electrical line interconnecting said sixth terminal of said third solenoid coil with a second electrode of said second capacitor;

a sixth electrical line interconnecting said sixth terminal of said third solenoid coil with said first junction point between said first and said second solenoid coils;

sample supporting means arranged at said central point within said second solenoid coil.

5,180,983

IGNITION PLUG FOR AN INTERNAL COMBUSTION ENGINE PROVIDED WITH AN IONIZATION CURRENT DETECTOR ELECTRODE

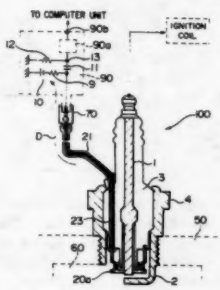
Shigemi Murata, and Masayuki Ikeuchi, both of Himeji, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Sep. 24, 1991, Ser. No. 764,744

Claims priority, application Japan, Sep. 27, 1990, 2-255139; Oct. 2, 1990, 2-263048; Oct. 11, 1990, 2-270616; Oct. 12, 1990, 2-272102; Oct. 12, 1990, 2-272103; Oct. 12, 1990, 2-272104

Int. Cl.[5] G01N *27/70;* G01M *19/02;* H01T *13/22*

U.S. Cl. 324—399 10 Claims



1. An ignition plug for an internal combustion engine, comprising:

a housing;

a cylindrical electrical insulator centrally extending through said housing;

a central electrode coupled to and centrally extending through said electrical insulator, said central electrode having a first end exposed within a combustion chamber of the internal combustion engine and a second, opposite end adapted to be electrically connected to an ignition coil through a first dedicated connection line;

a grounded electrode opposing the central electrode across a predetermined gap, to generate a spark therebetween to ignite a fuel/air mixture within the combustion chamber of the internal combustion engine; and

an ionization current detecior electrode coupled to said electrical insulator, and having a first end exposed to the fuel/air mixture within the combustion chamber and a second end adapted to be connected to an ionization current detector circuit through a second dedicated connection line, said second dedicated connection line being separate and distinct from said first dedicated connection line to prevent noise generated at ignition from affecting detection of ionization current by said ionization current detector circuit.

5,180,984

ION CURRENT SENSING DEVICE FOR AN INTERNAL COMBUSTION ENGINE WITH SPURIOUS VOLTAGE PREVENTING FILTER

Shigemi Murata, and Masayuki Ikeuchi, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1991, Ser. No. 774,233

Claims priority, application Japan, Oct. 12, 1990, 2-272109

Int. Cl.[5] F02P *17/00*

U.S. Cl. 324—399 2 Claims

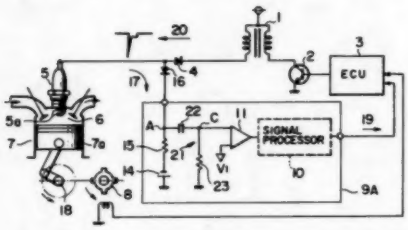
1. An ion current sensing device for an internal combustion engine having a spark plug with electrodes present in a combustion chamber in a cylinder, said device comprising:

a) a power source (**14**) for supplying a bias voltage to the electrodes of said spark plug;

b) ion current sensing means (**15, 16**) connected between the

electrodes of said spark plug and said power source for sensing as a voltage an ion current which is generated between the electrodes of said spark plug each time a mixture in the combustion chamber is combusted;

c) signal processing means (**10, 11**) for comparing the voltage corresponding to the ion current as sensed by said ion current sensing means with a reference voltage and generating an output signal when the voltage corresponding to the ion current is higher than the reference voltage; and



d) means for preventing a spurious voltage from being applied to the signal processing means due to a leakage current flow through the power source and the ion current sensing means resulting from spark plug contamination, said preventing means comprising:

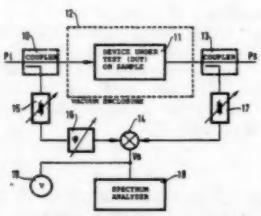
e) a filter (**21**) connected between said ion current sensing means and said signal processing means for passing only AC components of the voltage corresponding to the ion current to said signal processing means while blocking a DC component of the voltage as sensed by said ion current sensing means.

5,180,985

MULTIPACTOR EFFECT MEASUREMENT DEVICE USING PHASE NOISE

Walter Zoccarato, Plaisance du Touch; Théron Bernard, Saint-Orens, and Régis Barbaste, Portet, all of France, assignors to Alcatel Espace, Courbevoie, France

Filed Jun. 19, 1991, Ser. No. 717,604
Claims priority, application France, Jun. 22, 1990, 90 07853
Int. Cl.[5] G01R *23/16*
U.S. Cl. 324—613 **4 Claims**



1. An apparatus for measuring a multipactor effect comprising:

a series connection of a first coupler, a vacuum enclosure where a device under test is enclosed, and a second coupler, said series connection being coupled between an input which receives incident power and an output which delivers output power; and

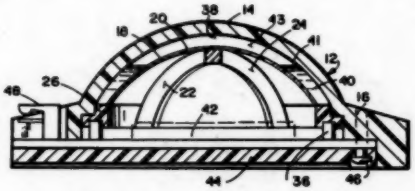
a mixer operated as a phase detector having a first input connected to an output of said first coupler to sample part of said input power via a first attenuator and a phase-shifter and a second input connected to an output of said second coupler to sample a part of said output power via a second attenuator, an output of said mixer being connected to a noise measuring device.

5,180,986

TWO AXIS CAPACITIVE INCLINATION SENSOR

Harold L. Swartz; Warren W. Stansberry, both of Phoenix; Jeffrey C. Heidel, Glen Dale, and Bradley D. Carlson, Glen Dale, all of Ariz., assignors to Schaevitz Sensing Systems, Inc., Phoenix, Ariz.

Division of Ser. No. 355,014, May 22, 1989, Pat. No. 5,079,847.
This application Oct. 15, 1991, Ser. No. 775,593
Int. Cl.[5] G01R *27/26;* **G01C** *9/06*
U.S. Cl. 324—660 **10 Claims**



1. A capacitive sensing arrangement comprising:

a spherically shaped outer member having an inner concave common electrode surface;

an inner member disposed within said outer member, said inner member having an outer convex insulating surface and an inner concave electrically conductive surface, said inner concave electrically conductive surface being divided into first and second detecting electrodes;

means for locating said inner member with respect to said outer member so that a cavity is defined between said inner member outer convex surface and said outer member inner concave surface;

a quantity of dielectric fluid contained within said cavity;

oscillator means for generating a periodically alternating electrical signal; and

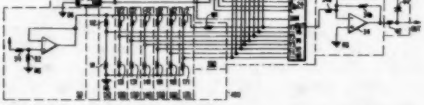
switching means connected to said first and second detecting electrodes for alternatively coupling said first detecting electrode and said second detecting electrode to said oscillator means, said switching means including state control means connected to receive said periodically alternating electrical signal for decoupling said first electrode from said oscillator means and for coupling said second electrode to said oscillator means in response to a level transition of said periodically alternating signal.

5,180,987

DC-TO-AC SYMMETRICAL SINE WAVE GENERATOR

Rolf H. G. Wendt, Beaverton, Oreg., assignor to NEC America Inc., Melville, N.Y.

Filed Dec. 19, 1991, Ser. No. 808,876
Int. Cl.[5] H03B *28/00, 19/00;* **H03K** *3/02, 4/02*
U.S. Cl. 328—14 **12 Claims**



1. A sine wave generator including a summing circuit receiving a plurality of predetermined voltages from a voltage divider via a pair of multiplexers responsive to a plurality of parallel bit sets generated by an up/down counter, the number of said predetermined voltages corresponding to a maximum

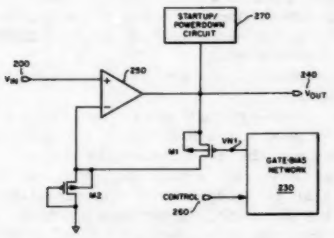
number represented by a predetermined number of bits included in a respective one of said parallel bit sets and each of said predetermined voltages being different from the remaining ones of said predetermined voltages, characterized in that said summing circuit outputs said predetermined voltages as voltages of a first polarity when said up/down counter counts from a predetermined number to a maximum number and when said up/down counter counts from said maximum number to said predetermined number and said summing circuit outputs said predetermined voltages as voltages of a second polarity when said counter counts from a minimum number to said predetermined number and when said counter counts from said predetermined number to said minimum number so as to permit said summing circuit to generate a sinusoidal signal in response to said parallel bit sets.

5,180,988

RESISTORLESS TRIM AMPLIFIER USING MOS DEVICES FOR FEEDBACK ELEMENTS

Bart R. McDaniel, Phoenix, Ariz., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 31, 1991, Ser. No. 816,153
Int. Cl.[5] H03G *3/12*
U.S. Cl. 330—282 **8 Claims**



1. A MOS trim amplifier circuit for providing multiplication of an input voltage by a quantized value, comprising:

an op-amp having a noninverting terminal for receiving an input voltage, an inverting terminal, and an output terminal for generating an output voltage, said output voltage being said input voltage times a quantized value;

multiplying feedback means coupled between said inverting terminal and said output terminal of said op-amp for providing a feedback voltage to said inverting terminal in response to a reference voltage such that said output voltage equals said input voltage times said quantized value, said quantized value being equal to (1+(reference voltage/input voltage));

gate bias means comprising a plurality of shorting MOSFETs and serially connected MOSFETs coupled to said multiplying feedback means for voltage-dividing said input voltage to generate said reference voltage such that said reference voltage is a fraction of said input voltage, each of said serially connected MOSFETs having its gate coupled to ground through a source/drain current path of each of said shorting MOSFETs, said input voltage being voltage-divided by selectively shorting over a predetermined number of said serially connected MOSFETs to ground through their corresponding shorting MOSFETs;

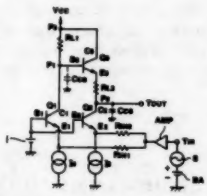
control means coupled to said gate bias means for selectively causing said predetermined number of said serially connected MOSFETs to short over to ground, said control means coupled to the gate of each of said shorting MOSFETs of said gate bias means to control said source/drain current path of each of said shorting MOSFETs.

5,180,989

WIDEBAND AMPLIFIER

Hisao Sakurai, and Seiichi Nishiyama, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 20, 1991, Ser. No. 747,697
Claims priority, application Japan, Aug. 20, 1990, 2-86987[U]
Int. Cl.[5] H03F *3/68*
U.S. Cl. 330—295 **14 Claims**



1. 1. A wideband amplifier, comprising:

a plurality of transistors, bases of which are commonly grounded;

a signal source means for generating input signals;

an input terminal connected to said signal source means;

a drive amplifier having an input connected to said input terminal;

a plurality of input resistors connecting an output of said drive amplifier to respective emitters of said plurality of transistors such that said emitters can receive input signals from said signal source;

a plurality of load resistors connected to respective collectors of said plurality of transistors; and

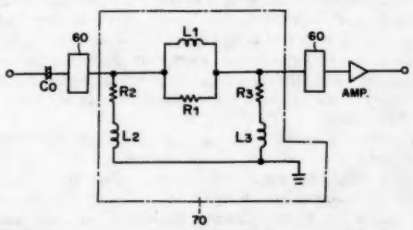
an output terminal connected to a junction where the collector of one of said transistors and one of said plurality of load resistors are connected with each other.

5,180,990

EQUALIZER CIRCUIT, HIGH FIDELITY REGENERATIVE AMPLIFIER INCLUDING EQUALIZER CIRCUIT AND ACOUSTIC CHARACTERISTIC CORRECTION CIRCUIT IN HIGH FIDELITY REGENERATIVE AMPLIFIER

Saburoh Ohkuma, 2-20-8, Nan-yodai, Hachioji-shi, Tokyo, Japan

Filed Aug. 20, 1991, Ser. No. 747,649
Int. Cl.[5] H03F *3/181*
U.S. Cl. 330—304 **3 Claims**



2. A high fidelity regenerative amplifier comprising an amplifier circuit for amplifying regenerated sound with high fidelity, a phase correction circuit connected to an input of said amplifier circuit to correct a phase characteristic of said amplifier circuit over a wide frequency range, and an equalizer circuit connected to said phase correction circuit and including a medium frequency and high frequency correction circuits made from passive circuit elements having a characteristic that a phase of an input aural signal advances as a frequency of the aural signal is increased in a higher frequency range than the vicinity of 1 KHz which comprises a resistor and an inductor

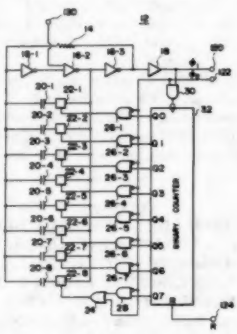
connected in one of series or parallel connection and having a circuit constant with a reverse phase characteristic of the sound field to be regenerated which advances a phase of the frequency from about 1 KHz to 5 KHz relatively in order to obtain far and near feeling, and a low frequency correction circuit having a characteristic that a phase of the input aural signal is delayed as the frequency of the aural signal is lowered in a lower frequency range than about 1 KHz which comprises a resistor and an inductor connected in one of parallel or series connection and having a circuit constant having a reverse characteristic to a peak of a resonance frequency of the sound field to be regenerated, said medium, high and low frequency correction circuits being connected to one another.

5,180,991

FREQUENCY ADJUSTABLE RC OSCILLATOR

Sumihiro Takashima, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1991, Ser. No. 743,813
Claims priority, application Japan, Aug. 14, 1990, 2-213773
Int. Cl.[5] H03B *5/20*; H03L *7/00*
U.S. Cl. 331—1 A **17 Claims**



1. An oscillator for generating an oscillator frequency from an oscillator output terminal thereof, comprising:

a binary counter for outputting an n-bit binary signal in response to the oscillator frequency generated from the oscillator output terminal, wherein n is a natural number, said binary counter further having n counter terminals consisting of a first counter terminal to an n-th counter terminal, an i-th terminal thereof outputting a first or second value corresponding to the i-th digit of the n-bit binary signal, wherein i is a natural number not greater than n; and

an oscillation circuit cooperatively coupled to the binary counter, the oscillation circuit comprising

(i) a resistor having a predetermined resistance,

(ii) n capacitors consisting of a first capacitor to an n-th capacitor, an i-th capacitor having an i-th capacitance Ci determined by the equation $Ci=Cn/(2^{n-i})$ wherein Cn is the capacitance of the n-th capacitor, and

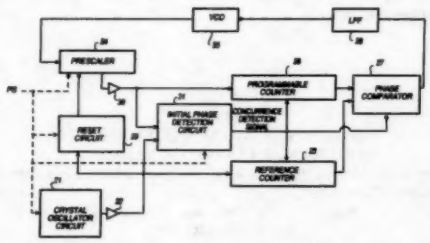
(iii) n switching elements coupled to respective ones said n counter terminals consisting of a first switching element to an n-th switching element, an i-th switching element therein selectively coupling an i-th capacitor in circuit with said resistor in response to the first value being generated from the i-th counter terminal, whereby said oscillator can generate a regulated oscillator frequency from the oscillator output terminal defined by the oscillation circuit.

5,180,992

PLL FREQUENCY SYNTHESIZER HAVING A POWER SAVING CIRCUIT

Takehiro Akiyama, and Kazumi Ogawa, both of Kasugai, Japan, assignors to Fujitsu Limited, Japan

Filed Oct. 17, 1991, Ser. No. 777,927
Claims priority, application Japan, Oct. 18, 1990, 2-279814
Int. Cl.[5] H03L *7/00*
U.S. Cl. 331—11 **7 Claims**



1. A PLL frequency synthesizer comprising:

an oscillator generating a first oscillation signal;

reference counter means, coupled to said oscillator, for generating a reference signal by frequency-dividing the first oscillation signal;

a voltage-controlled oscillator generating a second oscillation signal;

prescaler means, coupled to said voltage-controlled oscillator, for generating a first frequency-divided signal by frequency-dividing the second oscillation signal;

programmable counter means, coupled to said prescaler means, for generating a second frequency-divided signal by frequency-dividing the first frequency-divided signal;

phase comparator means, coupled to said reference counter means and said programmable counter means, for detecting a phase difference between the reference signal the second frequency-divided signal and for outputting a voltage signal based on the phase difference to the voltage controlled oscillator;

initial phase detection means, coupled to said prescaler means and said oscillator, for detecting a state where an edge of the first frequency-divided signal and an edge of the first oscillation signal are within a predetermined time range and for outputting a detection signal to said programmable counter means, said reference counter means and said phase comparator means when said state is detected, said programmable counter means, said reference counter means and said phase comparator means starting to operate in response to said detection signal;

reset means, coupled to said oscillator and said prescaler means, for determining whether or not said oscillator starts to normally generate the first oscillation signal in response to a predetermined external signal which intermittently operates said oscillator in a standby mode and for outputting a reset signal to said prescaler when it is determined that said oscillator normally generates the first oscillation signal; and

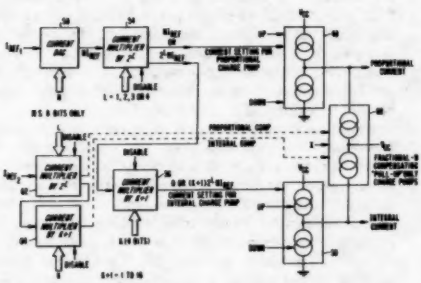
hold means, coupled to said prescaler means and said initial phase detection means, for preventing the first frequency-divided signal from being output to said programmable counter means and said initial phase detection means until said prescaler means is reset to an initial state in response to said reset signal and starts to normally generate said first frequency-divided signal.

5,180,993

METHOD AND ARRANGEMENT FOR FREQUENCY SYNTHESIS

Paul W. Dent, Stehag, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation-in-part of Ser. No. 633,981, Dec. 26, 1990, abandoned. This application Dec. 10, 1991, Ser. No. 804,609
Claims priority, application Sweden, Jan. 15, 1990, 9000137
Int. Cl.[5] H03L 7/197
U.S. Cl. 331—16 6 Claims



1. A fractional-N frequency synthesizer comprising:

an accumulator that is incremented by a value representing a fractional part of a desired frequency;

a variable divide-by-N circuit that is caused to divide by N_1 a defined proportion of the time and by N_2 a remaining portion of the time;

a phase comparator for comparing an output pulse train from said variable divider with a reference frequency pulse train to produce phase error pulses proportional in width to a timing difference between said pulse trains;

a first charge pump driven by said phase error pulses and producing first current pulses proportional in width to said phase error pulses and proportional in magnitude to a first programming current, said first current pulses being one of pull-up and pull-down current pulses;

a second charge pump driven by said phase error pulses and producing second current pulses proportional in width to said phase error pulses and proportional in magnitude to a second programming current, said second current pulses being one of pull-up and pull-down current pulses;

a first fractional-N ripple compensation current pulse generator producing pull-up current pulses proportional in width to contents of said accumulator and proportional in magnitude to a third programming current, an output of said first fractional-N ripple compensation current pulse generator being connected to a same circuit node as an output of said first charge pump such that said pull-up current pulses are added to said first current pulses to obtain a compensated proportional control circuit;

a second fractional-N ripple compensation current pulse generator producing pull-up current pulses proportional in width to contents of said accumulator and proportional in magnitude to a fourth programming current, an output of said second fractional-N ripple compensation current pulse generator being connected to a same circuit node as an output of said second charge pump such that said pull-up current pulses are added to said second current pulses to obtain a compensated integral control circuit; and

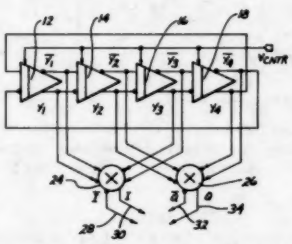
a loop filter having different input points to which respective ones of said compensated proportional control current and said compensated integral control current are applied to obtain an output voltage for controlling the frequency of a voltage controlled oscillator.

5,180,994

DIFFERENTIAL-LOGIC RING OSCILLATOR WITH QUADRATURE OUTPUTS

Kenneth W. Martin, Los Angeles, and Aaron W. Buchwald, Marina del Rey, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Feb. 14, 1991, Ser. No. 656,352
Int. Cl.[5] H03B 5/02, 27/00
U.S. Cl. 331—38 8 Claims



1. A ring oscillator having an output frequency, said ring oscillator comprising a plurality of inverting delay circuits coupled together in a cascaded series, each delay circuit having an input and an output, said output of one delay circuit coupled to said input of a next sequential one of said delay circuits, said plurality of delay circuits comprising a cascaded series, said cascaded series having a first delay circuit and a last delay circuit, said last delay circuit having its output coupled to said input of said first delay circuit, said cascaded series of delay circuits comprising an odd subplurality of delay circuits and an even subplurality of delay circuits alternately coupled in sequence to each other, said output circuit from consecutive odd delay circuits being 90 degrees out of phase with respect to each other, said outputs from consecutive even delay circuits being 90 degrees out of phase with respect to each other,

wherein each said delay circuit has a differential input and differential output and wherein consecutive odd delay circuits have differential outputs whose differentials are 90 degrees out of phase with respect to each other,

further comprising a plurality of mixer circuits, each mixer circuit for receiving two output signals from said cascaded series of delay circuits and generating a mixed output therefrom, each one of said plurality of said mixer circuits having outputs from said cascaded series of delay circuits coupled thereto which are 90 degrees out of phase with each other so that said output of said mixer circuit is twice the frequency of said ring oscillator.

5,180,995

TEMPERATURE-COMPENSATED RING OSCILLATOR CIRCUIT FORMED ON A SEMICONDUCTOR SUBSTRATE

Isamu Hayashi, and Harufusa Kondoh, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1992, Ser. No. 825,219
Claims priority, application Japan, Sep. 13, 1991, 3-234291
Int. Cl.[5] H03L 1/02
U.S. Cl. 331—57 7 Claims

1. A ring oscillator circuit formed on a single semiconductor substrate, comprising:

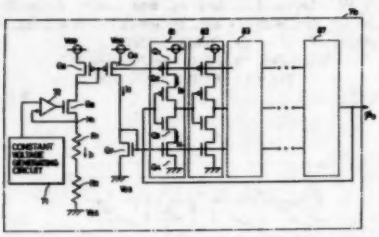
oscillator circuit means including an odd number of inverter means cascaded in a ring-like manner;

said oscillator circuit means having an oscillation frequency changed dependent on change of an ambient temperature,

a constant voltage generating means; and

a constant current supplying means supplied with a constant voltage generated from said constant voltage generating means and supplying a constant current to said oscillator circuit means; and

temperature compensating means connected to said constant current supplying means for compensating change of the



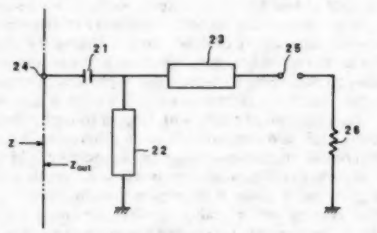
oscillation frequency of said oscillator circuit means by controlling output current from said constant current supplying means in response to the ambient temperature.

5,180,996

HIGH FREQUENCY OSCILLATOR HAVING CAPACITOR AND MICROSTRIP LINE OUTPUT FILTER

Nobuo Shiga, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan

Filed Nov. 15, 1991, Ser. No. 791,739
Claims priority, application Japan, Nov. 16, 1990, 2-311060
Int. Cl.[5] H03B *5/18*
U.S. Cl. 331—77 **2 Claims**



1. A high-frequency oscillator comprising:

a signal generator for generating a high-frequency signal; and

a signal output circuit, connected to said signal generator, for outputting a high-frequency signal generated by said signal generator, said output circuit having a capacitor and a microstrip line,

one end of said microstrip line being directly connected with one terminal of said capacitor, the other end of said microstrip line being connected to a reference potential, and the other terminal of said capacitor being connected with an output terminal of said signal generator, whereby said oscillator performs signal matching between said signal generator and said signal output circuit and prevents propagation of signal components having double the frequency of an oscillating frequency generated by said signal generator.

5,180,997

MICROSTRIP HIGH REVERSE LOSS ISOLATOR

Richard A. Stern, Allenwood, and Richard W. Babbitt, Fair Haven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 24, 1991, Ser. No. 782,190
Int. Cl.[5] H01P *1/36*
U.S. Cl. 333—24.2 **6 Claims**

1. A microstrip high reverse loss isolator comprising

a microstrip dielectric substrate having substantially planar top and bottom surfaces;

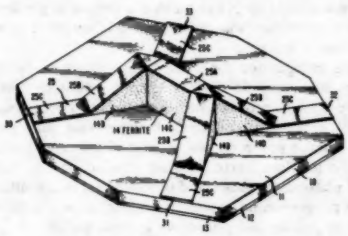
an electrically conductive ground plane mounted on the bottom surface of said substrate;

a ferrite element mounted on the top surface of said substrate, said ferrite element having

a pair of spaced apart central portions, each of said central portions being shaped as a right prism having three rectangular prism faces of substantially equal area and top and bottom prism bases shaped as equilateral triangles, the bottom prism base of each of said pair of central portions abutting the top surface of said substrate,

a connecting arm portion extending radially outwardly from and joining one of the prism faces of one of said pair of central portions to one prism face of the other of said pair of central portions, said connecting arm portion having a top surface joining the top bases of said pair of central portions and a bottom surface joining the bottom bases of said pair of central portions, and

four transition arm portions extending radially outwardly from the four remaining prism faces of said pair of central portions, each of said transition arm portions having a height which decreases linearly from the full height of the top prism base above the bottom prism base of the central portion from which it extends at the end of the transition arm portion which abuts the prism face to zero height at the other end of the transition arm portion, so that the top surface of each of said transition arm portions slopes downwardly from the top prism base of the central portion from which it extends to the



top surface of said substrate and the bottom surface of each transition arm portion is coplanar with the bottom prism base of the central portion from which it extends and abuts the top surface of said substrate;

electrically conductive microstrip conductor means associated with each of said ferrite element arm portions, said microstrip conductor means having a first portion thereof mounted on the top bases of said pair of ferrite element central portions and the top surface of said ferrite element connecting arm portion, a second portion thereof extending down the sloping top surface of the ferrite element transition arm portion associated therewith and a third portion thereof mounted on the top surface of said substrate in alignment with the ferrite element transition arm portion associated therewith;

energy dissipating load means terminating each of the third portions of said microstrip conductor means associated with two of said four ferrite element transition arm portions, said two transition arm portions being disposed at opposite ends of one of the sides of said ferrite element connecting arm portion; and

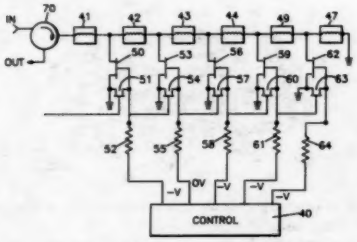
magnetic biasing means for applying dc magnetic fields having the same magnetic direction between the top and bottom prism bases of said pair of prism shaped ferrite element central portions to cause said pair of ferrite element central portions to act as a pair of tandem connected microstrip Y-junction circulators and the third portions of said microstrip conductor means associated with the remaining two of said four ferrite element transition arm portions to act as the ports of the microstrip isolator.

5,180,998

SWITCHED TRANSMISSION LINE PHASE SHIFTER APPARATUS EMPLOYING MULTIPLE JETS

David A. Willems, Salem, Va., assignor to ITT Corporation, New York, N.Y.

Filed Nov. 5, 1991, Ser. No. 788,050
Int. Cl.[5] H03H *11/20*
U.S. Cl. 333—164 **15 Claims**



1. A switched phase shifter including:

a transmission line including a plurality of inductive elements arranged in series from a first end to a second end of said line and having a first inductive element and subsequent inductive elements, said line including a first line junction between said first inductive element and a subsequent inductive element and a subsequent line junction between each of said subsequent inductive elements, wherein said first line junction is shunted to a point of reference potential by a first semiconductor element and each said subsequent line junction is shunted to a point of reference potential by a subsequent semiconductor element, wherein said first semiconductor element and each said subsequent semiconductor element operate as a capacitor in a first non-conducting state (OFF) and as a short circuit in a second conducting state (ON) wherein the length of said line can be selectively changed according to the semiconductor element which is biased ON, the improvement therewith, wherein each semiconductor element at said first line junction and each said subsequent line junction includes a FET pair including a first FET having a source, drain and gate electrode and having the source to drain path connected between a junction and a point of reference potential;

a second FET having a source, drain and gate electrode, with said source to drain path coupled between said gate electrode of said first FET and said point of reference potential whereby each said subsequent line junction toward said second end of said line each includes an FET pair; and

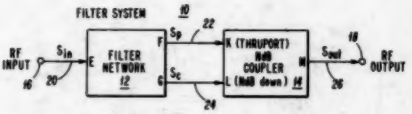
a resistor associated with each FET pair, said resistor having one terminal connected to said gate electrode of said first FET of said associated FET pair wherein said resistor has a larger impedance value than the effective ON resistance of said first FET of said associated FET pair, with the junction between said one terminal of said resistor and said gate electrode of said first FET of each said associated FET pair connected to said gate electrode of said second FET of said FET pair at said subsequent line junction toward said second end of said line, whereby each lien junction or tap between inductances is similarly connected; with each other terminal of each resistor associated with each said FET pair adapted to be connected to a control bias source whereby when a conducting bias is applied to said other terminal of a selected resistor associated with a selected first FET of a selected FET pair said selected first FET turns ON to turn ON said second FET at said subsequent junction towards said second end of said line which turns ON said first FET of said FET pair at said subsequent junction, whereby all FETs at all junctions between said selected turned ON FET and said second end of said line are turned ON, with all FET pairs positioned after said selected FET pair towards said first end of said line remaining in said OFF state and appearing as a capacitor, whereby the length of said line is changed by applying a single operating ON bias via said resistor to only one FET pair located at a line junction selected according to said desired line length.

5,180,999

FILTER SYSTEM WITH CONTROLLED AMPLITUDE IN STOPBAND OR PASSBAND

Richard C. Edwards, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 28, 1990, Ser. No. 589,744
Int. Cl.[5] H03H *7/00*
U.S. Cl. 333—175 **18 Claims**



11. A filter system featuring prescribed gain and low ripple in a controlled amplitude band, comprising:

means for dividing the frequency spectrum of an input signal into a primary spectrum output and a complimentary spectrum output and defining the bandwith of said controlled amplitude band; and

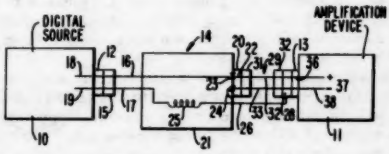
a NdB directional coupler configured as a combiner and including a first thruport connected for receiving one of said spectrum outputs, a second NdB down input port connected for receiving the other of said spectrum outputs and a filter system output.

5,181,000

DIGITAL INTERFERENCE FILTER FOR AUDIO SYSTEMS

Lawrence C. Smith, Lynbrook, N.Y., assignor to Perfectionist Audio Components Inc., Malverne, N.Y.

Filed Jan. 21, 1992, Ser. No. 822,864
Int. Cl.[5] H03H *7/00*
U.S. Cl. 333—181 **2 Claims**



1. A filter device for blocking transmission from a digital source to the amplification device of an audio system of high frequency components generated by and present in the ground circuits of said source comprising a conductive enclosure forming a shield, an input connector secured to said enclosure and having positive and ground leads adapted to be connected to the positive and ground outputs respectively of said source, said leads being electrically isolated from said enclosure, an output connector mounted on said enclosure and including a positive terminal connected to said positive lead of said input connector and a ground terminal connected to said enclosure, a ground conductor extending and electrically isolated from said enclosure, an inductor mounted in said enclosure in series connection between said ground lead of said input connector

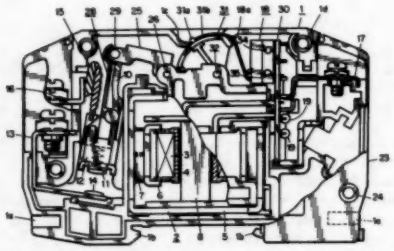
and said ground conductor, and jack means electrically connected to said ground conductor for electrically coupling said ground conductor to the ground of the amplification device, whereby said ground conductor forms the sole connection between the ground output of said source and said ground of said amplification device.

5,181,001

REMOTELY-CONTROLLED RELAY

Hiroaki Fujihisa, and Manabu Sogabe, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1991, Ser. No. 704,192
Claims priority, application Japan, May 23, 1990, 2-133022
Int. Cl.[5] H01H *75/00*
U.S. Cl. 335—14 **8 Claims**



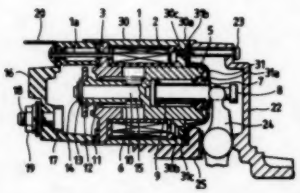
1. A remotely-controlled relay comprising:
a bistable polar electromagnet device;
a main-circuit opening-and-closing assembly driven by said bistable polar electromagnet device;
a housing for housing said bistable polar electromagnet device and said main-circuit opening-and-closing assembly, said housing having an aperture; wherein said bistable polar electromagnet device includes;
a coil energized selectively in a first direction and in a second direction by a current supplied from an external circuit;
a switch circuit connected with said coil and selectively forming a first current path in which said coil is energized in said first direction and a second current path in which said coil is energized in said second direction;
a plunger magnetized by said coil such that said plunger moves through a stroke between a first position and a second position, said plunger moving to said first position when said coil is energized in said first direction and moving to said second position when said coil is energized in said second direction;
a lever pivotally supported by said housing and driven by said plunger to pivot, said lever driving said switch circuit to form said first current path when said plunger arrives at a center of said stroke during the time when said plunger moves from said first position to said second position, said lever driving said switch circuit to form said second current path when said plunger arrives at said center of said stroke during the time when said plunger moves from said second position to said first position, said lever having a manually-operated handle for manually operating said main-circuit opening-and-closing assembly, said lever being accessible through said aperture; and
a link having a first end driven by said plunger and a second end connected to said main-circuit opening-and-closing assembly, and pivotally supported by said housing at an intermediate position between said first end and said second end, said link causing said main-circuit opening-and-closing assembly to close when said plunger moves to said first position and to open when said plunger moves to said second position.

5,181,002

ELECTROMAGNETIC SWITCH FOR STARTER

Takeshi Sugiyama, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Dec. 26, 1991, Ser. No. 813,513
Claims priority, application Japan, Dec. 28, 1990, 2-417244
Int. Cl.[5] H01F *7/08*; H01H *50/60*
U.S. Cl. 335—131 **6 Claims**



1. An electromagnetic switch supported by a bracket of a starter, comprising:
a cylindrical case having a plurality of insertion holes on a front edge surface thereof;
an exciting coil mounted on said case;
a plunger movably supported along an axis of said case on an inner surface of a first portion of said case;
a core mounted on said case, said plunger selectively movable between a first position and a second position, said plunger being attracted to said core and movable to said second position from said first position by excitation produced by said exciting coil;
a rod disposed at a rear portion of said plunger;
a movable contact supported at a rear edge of said rod and being insulated;
a fixed contact, disposed on said case, contacting said movable contact by movement of said plunger from said first position to said second position;
a hook having a portion thereof inserted in said plunger;
a sleeve bearing supporting said plunger and fixed to a front inner surface of said plunger;
a compression spring being positioned within said plunger, said hook being biased in a direction towards said fixed contact by said compression spring in said plunger;
a plunger cover comprising elastic material and covering a front surface of said plunger, said plunger cover including an inner circumferential edge portion fixed to an outer circumferential edge surface of said sleeve bearing, and a flange portion on an outer circumferential edge portion of said plunger cover tightly contacting a front edge surface of said case and a rear edge surface of said bracket,
wherein said flange portion has a plurality of axial projections on an inside surface thereof; and
wherein said axial projections are inserted in the insertion holes disposed on the front edge surface of said case, and said case includes an axially extending rim on its front circumference to enclose the outer circumference of said flange portion of said plunger cover.

5,181,003

ELECTROMAGNETIC SOLENOID VALVE

Shigeo Yamashita, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

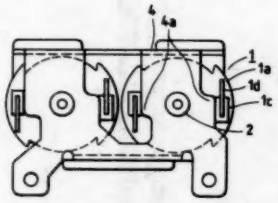
Filed May 7, 1991, Ser. No. 696,816
Claims priority, application Japan, May 11, 1990, 2-49306[U]
Int. Cl.[5] H01F *5/00*
U.S. Cl. 335—282 **3 Claims**

1. An electromagnetic solenoid valve, comprising:
a coil bobbin;
a coil being wound around said coil bobbin;
a core being inserted into said coil bobbin;
a plunger which confronts said core and reciprocates within said coil bobbin;

a terminal for supplying a current to said coil, said terminal being fixedly attached to one end of said coil bobbin; and

a polygonal plate disposed at said one end of said coil bobbin, for forming a magnetic path;

wherein said coil bobbin is provided with a rectangular



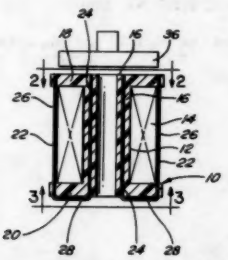
projecting portion, one side of which abuts against and is engaged with a linear edge of said polygonal plate to thereby prevent rotation of said coil bobbin and to prevent shortcircuiting between said terminal and said plate, and projecting portion comprising a terminal outlet provided for said terminal.

5,181,004

SOLENOID COIL ASSEMBLY

Kenric J. Johnson, Newport News, Va., assignor to Siemens Automotive L.P., Auburn Hills, Mich.

Filed May 11, 1992, Ser. No. 881,440
Int. Cl.[5] H01F *27/26*
U.S. Cl. 336—198 **10 Claims**



1. A solenoid coil assembly comprising a bobbin containing an electromagnetic coil thereon, and a magnetically permeable conductor for conducting magnetic flux issued by said coil when energized, characterized in that said magnetically permeable conductor comprises plural magnetically permeable wires circumferentially arranged around said bobbin, each of said wires comprises side segments that have distal ends and that are joined together at proximal ends by a base segment, one of said side segments of each wire is disposed radially inwardly of said coil and the other of said side segments of each wire is disposed radially outwardly of said coil, and at least one of said side segments of each wire passes through a corresponding hole in said bobbin.

5,181,005

THERMAL SWITCH

Helmut Bayer, Vienna, Austria, assignor to Electrovac Fabrikation Elektrotechnischer, Vienna, Austria

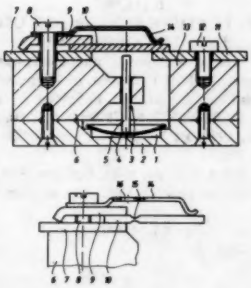
Filed Oct. 22, 1991, Ser. No. 780,231
Claims priority, application Austria, Oct. 25, 1990, 2159/90
Int. Cl.[5] H01H *37/52, 37/54*
U.S. Cl. 337—354 **11 Claims**

1. A thermal switch comprising:

a thermal bimetallic snap-over disc temperature sensor;

a contact system including a fixed contact assembly and a movable contact assembly, said movable contact assembly including a plastically deformable portion, said movable contact assembly contacting said fixed contact assembly in a quiescent state; and

a transmission component, directly contacting said disc and



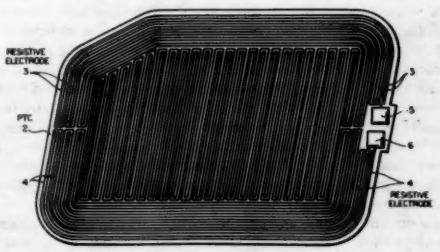
said plastically deformable portion, said transmission component plastically deforming said plastically deformable portion when actuated by said disc, said plastic deformation of said plastically deformable portion breaking contact between said fixed contact assembly and said movable contact assembly.

5,181,006

METHOD OF MAKING AN ELECTRICAL DEVICE COMPRISING A CONDUCTIVE POLYMER COMPOSITION

Jeff Shafe; O. James Straley, both of Redwood City; Gordon McCarty, San Jose; Ravinder K. Oswal, Union City, and Amitkumar N. Dharia, Newark, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 247,026, Sep. 20, 1988, Pat. No. 5,093,036.
This application Dec. 11, 1991, Ser. No. 805,212
Int. Cl.[5] H01C *7/10, 7/13*
U.S. Cl. 338—22 R **18 Claims**



5. An electrical device which comprises

(1) a first electrode,

(2) a second electrode, and

(3) a resistive element which exhibits PTC behavior and which is supported by a substrate and which has been prepared by

(a) mixing (i) carbon black which has a pH of less than 4.0, (ii) an organic polymer which has a crystallinity of at least 5% and a melting point T_m, and (iii) an active solvent for the polymer;

(b) allowing the polymer to dissolve in the solvent to form an ink;

applying the ink to the substrate to form the resistive element which, when cured, will exhibit PTC behavior; and

(d) curing the ink by heating at a temperature T_c for a time sufficient to remove the solvent,

the first and the second electrodes being connectable to a source of electrical power to pass current between the electrodes.

5,181,007

PTC TEMPERATURE SENSOR FOR USE IN AN EXHAUST GAS SYSTEM

Karl-Hermann Friese, Leonberg, and Hans-Martin Wiedenmann, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

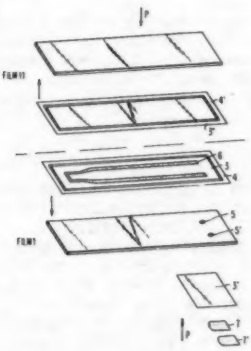
PCT No. PCT/DE88/00527, § 371 Date Jan. 10, 1990, § 102(e) Date Jan. 10, 1990, PCT Pub. No. WO89/03033, PCT Pub. Date Apr. 6, 1989

PCT Filed Aug. 30, 1988, Ser. No. 459,752

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1987, 3733192

Int. Cl.[5] H01C *7/10*

U.S. Cl. 338—22 R **2 Claims**



1. PTC temperature sensor, in particular for use in the exhaust gas system of internal combustion engines, comprising a sensing element including a PTC resistor connected to conductor webs disposed in a housing, the PTC resistor and the conductor webs being composed of a homogeneous material to form a PTC resistor track, the temperature sensing element being formed from laminated composite of ceramic films in which the PTC resistor track is hermetically encapsulated with respect to the gas being measured and the ambient air, the laminated composite of the temperature sensing element being formed from two solid electrolyte ceramic films including a base film having the PTC resistor track printed on by thick-film technology and a second film which is laminated together with and sintered together with the base film, the solid electrolyte ceramic films being composed of films of ZrO_2 stabilized with yttrium, and insulating layers being provided between the PTC resistor track and at the solid electrolyte films respectively.

5,181,008

DIAMOND ENCAPSULATED RESISTANCE TEMPERATURE DETECTOR

Kevin B. Martin, and Ralph G. Martin, both of P.O. Box 2321, Atascadero, Calif. 93423

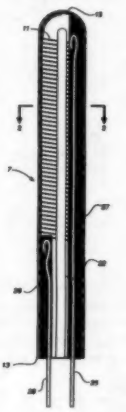
Filed Oct. 15, 1990, Ser. No. 597,055

Int. Cl.[5] H01C *3/10*; G01K *7/16*

U.S. Cl. 338—28 **5 Claims**

1. A resistance temperature probe allowing for rapid sensing of temperatures by means of an element whose electrical resistance varies with temperature, comprising:

a. coil means formed of a fine wire coil, the fine wire having the characteristic that its electrical resistance varies with temperature; and



b. a deposited protective coating of diamond which is deposited over the fine wire coil, encasing the fine wire coil, the deposited protective coating of diamond being in direct thermal proximity to the environment.

5,181,009

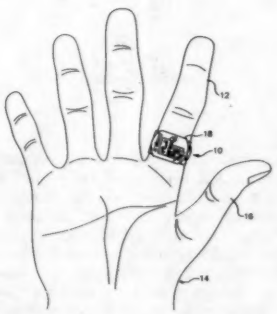
TIMING AND SCOREKEEPING RING

Ronald J. Perona, 18209 NE. 196th St., Woodinville, Wash. 98072

Filed Oct. 29, 1990, Ser. No. 604,866

Int. Cl.[5] G08B *5/00*

U.S. Cl. 340—407 **2 Claims**



1. An indicator ring to be worn on the finger of a user, the indicator ring comprising:

a case having means thereon for attaching said body to the finger of a user;

an electronic information storage and display device for visually displaying information stored in said electronic information storage and display device;

at least one switch positioned on the exterior of said case to be operated by an adjacent finger to the finger on which said case is mounted for entering, deleting, and altering information stored in said electronic information storage and display device; and

an alarm associated with said case and connected to said electronic information storage and display device that is selectively programmable to generate an audible alarm and includes a vibration device to simultaneously percep-

tibly stimulate the adjacent skin of the user at a predetermined time;

whereby said electronic storage and display device is configured to display the down and seconds, and said at least one switch being connected to said electronic information storage and display device such that pressing of said at least one switch once causes said seconds display to freeze at the current number of seconds and not advance;

pressing of said at least one switch twice causes said electronic storage and display device to display the next down;

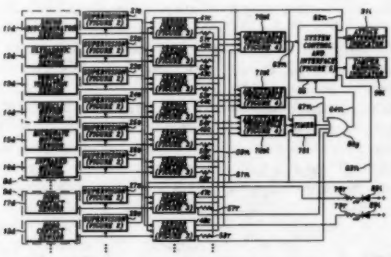
pressing of said at least one switch three times causes said seconds display to reset and being displaying seconds until 25 seconds has elapsed, at which time said alarm will activate; and

pressing of said at least one switch four times causes said electronic storage and display device to reset said seconds display and being displaying seconds until 60 seconds has elapsed, at which time said alarm is activated.

5,181,010
AUTOMOTIVE SECURITY SYSTEM WITH DISCRIMINATION BETWEEN TAMPERING AND ATTACK

James S. Chick, 6199 Canterbury Dr., #302, Culver City, Calif. 90230

Continuation of Ser. No. 228,603, Aug. 4, 1988, abandoned. This application Feb. 13, 1991, Ser. No. 656,113
Int. Cl.[5] B60R *25/10*
U.S. Cl. 340—426 **25 Claims**



1. A vehicle security system, comprising:

a plurality of environmentally sensitive sensors, each to the ambient environment and generating an output signal when activated;

at least one environmentally insensitive sensor, insensitive to the ambient environment and generating an output signal when activated.

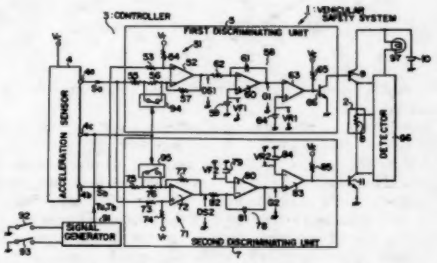
alarm signal generating means for generating one of plural types of alarm signals in response to activation of said environmentally sensitive sensors and said at least one environmentally insensitive sensor; and

control means for controlling the type of alarm signal generated by said alarm signal generating means, wherein said control means said alarm signal generating means to generate an attack alarm signal when said at least one environmentally insensitive sensor is activated and an attack alarm signal when a predetermined number of environmentally sensitive sensors are activated, said predetermined number being greater than one, and further wherein said control means control said alarm generating means to generate a tamper alarm signal when a number of environmentally sensitive sensor less than said predetermined number are activated.

5,181,011
METHOD FOR CHECKING THE OPERABILITY OF SAFETY SYSTEM FOR VEHICLES

Masami Okano, Higashimatsuyama, Japan, assignor to Zexel Corporation, Tokyo, Japan

Filed Aug. 31, 1991, Ser. No. 744,414
Claims priority, application Japan, Aug. 14, 1990, 2-215251
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 340—438 **8 Claims**



1. A method for checking operability of a vehicle safety system, which comprises a vehicle safety device; a firing member for activating said vehicle safety device; an acceleration sensing means for providing a pair of output signals which correspond to acceleration of a vehicle but are opposite in phase from each other; a first discriminating means which includes a first differential amplifying means responsive to said acceleration sensing means for producing a first detection signal corresponding to the difference between the pair of output signals and discriminates occurrence of collision of the vehicle in response to the first detection signal; a second discriminating means which includes a second differential amplifying means responsive to said acceleration sensing means for producing a second detection signal corresponding to the difference between the pair of output signals and discriminates the occurrence of collision of the vehicle in response to the second detection signal; a first means responsive to said first discriminating means for allowing a current to flow therethrough between one terminal of said firing member and a power source when the occurrence of collision of the vehicle is discriminated by said first discriminating means; and a second means responsive to said second discriminating means for allowing a current to flow therethrough between the other terminal of said firing member and the power source when the occurrence of collision of the vehicle is discriminated by said second discriminating means; whereby a firing current is allowed to flow through said firing member from the power source when both said first and second means are rendered operative at the same time, said method comprising the steps of:

causing said acceleration sensing means to produce a pair of check signals which are identical;

making a circuit change in one of said first and second differential amplifying means to enable it to respond to an in-phase input;

detecting whether or not a potential difference is developed across said firing member in response to application of the check signals to said first and second differential amplifying means; and

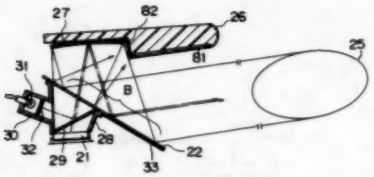
discriminating the operability of said vehicle safety system from a result obtained in said detecting steps.

5,181,012

DISPLAY APPARATUS FOR AUTOMOBILES

Yoshiyuki Furuya; Tadashi Iino, and Kunimitsu Aoki, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Sep. 23, 1991, Ser. No. 763,728
Claims priority, application Japan, Sep. 27, 1990, 2-101965[U]
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 340—461 6 Claims



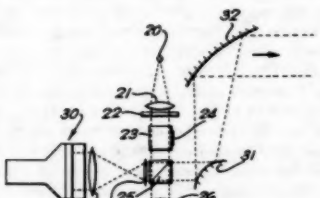
1. A display apparatus for automobiles comprising:
an indicator;
a reflection member having a reflection surface which opposes a display surface of said indicator;
a light transmissible reflection member arranged between said indicator and said reflection member for transmitting display light of said indicator and for reflecting reflected light from said reflection member to a visual field;
a meter hood extending from a dashboard toward a visual field side of said light transmissible reflection member, said reflection member located within said meter hood; and
a shading means, connected to said meter hood and extending below said reflection surface of said reflection member which is located on said meter hood, for preventing external light from being reflected from end portions of said light transmissible reflection member into said visual field.

5,181,013

DISPLAY APPARATUS

John M. Bagshaw, Chelmsford, and Donald C. Bowles, Tonbridge, both of United Kingdom, assignors to GEC-Marconi Limited, Middlesex, United Kingdom

Filed Oct. 5, 1989, Ser. No. 417,512
Int. Cl.[5] G09G *1/28*
U.S. Cl. 340—702 16 Claims



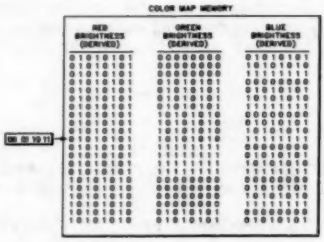
1. A display apparatus comprising a spatial light modulator having a photosensitive input surface and an output surface, the input surface being arranged to vary the light reflectance characteristics of the output surface according to an image formed on the input surface, a cathode ray tube having a phosphor screen, the phosphor screen being coupled to the input surface of the spatial light modulator, whereby successive frames of an image formed by the cathode ray tube onto said screen are each reproduced as a reflectance pattern at the output surface; and a light source operable to irradiate the output surface with light of a variable wavelength and/or variable intensity each selected cyclically in synchronism with and in accordance with each frame of the image formed by the cathode ray tube.

5,181,014

METHOD AND APPARATUS FOR REPRESENTING THREE-DIMENSIONAL COLOR DATA IN A ONE-DIMENSIONAL REFERENCE SYSTEM

John C. Dalrymple, Portland, and Scott W. Bigger, Tigard, both of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Continuation of Ser. No. 113,030, Oct. 26, 1987, abandoned.
This application May 22, 1989, Ser. No. 355,866
Int. Cl.[5] G09L *1/28*
U.S. Cl. 340—703 1 Claim



1. A method of representing multi-dimensional data values in a one-dimensional memory addressing system, the method comprising the steps of:
producing multi-dimensional data values calculated from user-specified numbers of data levels, each user-specified number representing a quantity of data values in a dimension;
storing the multi-dimensional data values in a memory in a predetermined sequence suitable for referencing by a one-dimensional address; and
producing the one-dimensional address calculated from a user-specified multi-dimensional data value, the one-dimensional address being effective for referencing multi-dimensional data values stored in the memory corresponding to the user-specified multi-dimensional data value.

5,181,015

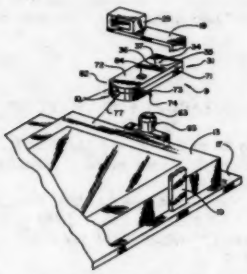
METHOD AND APPARATUS FOR CALIBRATING AN OPTICAL COMPUTER INPUT SYSTEM

Roger N. Marshall, Solana Beach; Lane T. Hauck, San Diego; Leonid Shapiro, Lakeside; Jeffrey W. Busch, San Diego, and Eric S. Stevens, El Cajon, all of Calif., assignors to Proxima Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 433,029, Nov. 7, 1989, abandoned. This application Nov. 9, 1990, Ser. No. 611,416
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—706 32 Claims

21. Optical input system calibration apparatus for facilitating alignment with an image reflected from a viewing surface, comprising:
a single light sensing device for detecting the presence of light produced from an image reflecting from the viewing surface;
means for mounting said single light sensing device for universal movement relative to said viewing surface;
detecting means for determining whether the entire reflected image from the viewing surface can be detected and for generating a plurality of electrical signals indicative of the direction of any miscalibration; and
indicating means responsive to said signals for providing indications of miscalibration directions when the entire

reflected image on the viewing surface can not be detected to indicate the direction of movement of said sensing device so that it can be adjusted positionally until it detects substantially the entire reflected image.

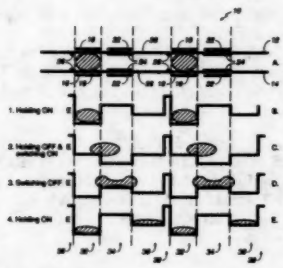


5,181,016

MICRO-VALVE PUMP LIGHT VALVE DISPLAY

Yee-Chun Lee, Cabin John, Md., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 15, 1991, Ser. No. 641,391
Int. Cl.[5] G09G *3/34*
U.S. Cl. 340—788 **14 Claims**



10. A pixel in a flat panel display, comprising a micro-pump light valve using a dielectric fluid drop and having a non-conductive transparent viewing area, a holding electrode, and a switching electrode therebetween for causing said drop to move between said viewing area and said holding electrode, wherein a non-wetted surface is disposed between said switching electrode and said fluid drop for cooperating with an electrical field established by said switching electrode to generate a potential energy gradient effective for accelerating said drop between said holding electrode and said viewing area.

5,181,017

ADAPTIVE ROUTING IN A PARALLEL COMPUTING SYSTEM

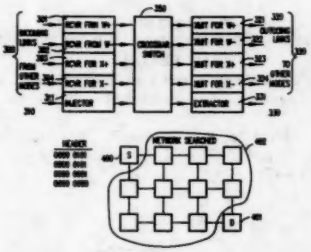
Alexander H. Frey, Jr., Pasadena, Calif.; Joel M. Gould, Norwood, Mass., and Charles M. Higgins, Jr., Baton Rouge, La., assignors to IBM Corporation, Armonk, N.Y.

Filed Jul. 27, 1989, Ser. No. 386,521
Int. Cl.[5] H04L *12/00, 12/46*
U.S. Cl. 340—825.02 **15 Claims**

1. A method for routing a message in a regular topology network between a source node and a destination node, said source node building a data transaction comprising a message and header, said header including bit groups that define nodal network paths, at least one node in one of said paths performing the steps of:

(a) employing one of said bit groups of said header to establish multiple connections from an input link receiver to output link transmitters within said one node, each of said output link transmitters linked with a succeeding node, said input link receiver linked to a preceding node;

(b) copying the header from said input link receiver to each of said connected output link transmitters;



(c) modifying each copied header so that said copied header defines network paths to said destination node from succeeding nodes linked to one of said connected output link transmitters into which said header was copied; and

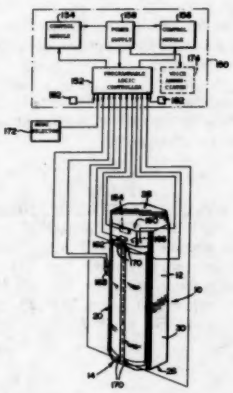
(d) transmitting said modified headers and said message to said succeeding nodes.

5,181,018

ACCESS CONTROL BOOTH WITH ARCUATE DOORS

Theo D. Cowie; John M. Malan, and Malcolm W. Thomas, all of Johannesburg, South Africa, assignors to Threshold Control Systems CC, Johannesburg, South Africa

Filed Mar. 25, 1991, Ser. No. 674,571
Int. Cl.[5] H04Q *1/00*
U.S. Cl. 340—825.31 **16 Claims**



1. An access control booth which includes:

a housing having a base member, a roof member and a side wall portion extending between the base member and the roof member, the side wall portion having a substantially circular inner plan profile to define a pair of opposed substantially arcuate access openings;

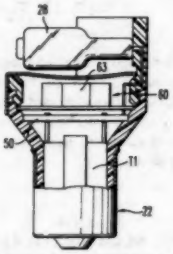
closure means for operably closing each access opening, each closure means being pivotally mounted within the housing via a pivot point arranged substantially centrally within the housing, each closure means comprising at least one arcuate member having a first arm pivotally mounted within the roof member, a second arm pivotally mounted

beneath the base member and an arcuate wall portion extending between the first arm and the second arm; and torsion-inhibiting means connected to the first arm and the second arm of each arcuate member for inhibiting twisting of the arcuate member as it pivots, the torsion-inhibiting means being arranged inwardly of the arcuate wall portion of the arcuate member.

5,181,019
WEIGHTED TRANSDUCER AND DRIVING CIRCUIT WITH FEEDBACK

Mark Gottlieb, Annandale, and Tom Roche, Spotsylvania, both of Va., assignors to Designtech International, Inc., Springfield, Va.

Filed Jul. 2, 1991, Ser. No. 724,932
Int. Cl.[5] B60Q *1/26*; H01L *41/04*
U.S. Cl. 340—474 **28 Claims**



1. A sound generating device coupled to a housing, wherein the sound generating device is employed in a combination back-up light and sound generating device for use with an automotive vehicle, comprising:

a vibrating device mounted to said housing and comprising:

a piezoelectric element; and

a weight mechanically coupled to said piezoelectric element;

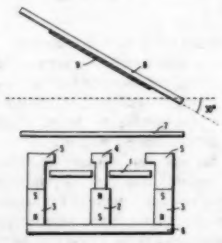
mounting means for mounting a light to said housing and means for mechanical and electrical connection to a vehicle tail light assembly;

wherein said weight is selected such that said vibrating device, said housing and said vehicle tail light assembly to which said housing is mechanically connected vibrate as a single unit to generate sound.

5,181,020
THIN-FILM MAGNETIC MATERIAL AND PROCESS OF PRODUCTION THEREOF

Shinji Furukawa; Kazuki Oka, and Akira Tanimura, all of Kyoto, Japan, assignors to Unitika, Ltd., Hyogo, Japan

Filed Mar. 22, 1991, Ser. No. 673,550
Claims priority, application Japan, Mar. 23, 1990, 2-075247
Int. Cl.[5] G08B *13/24*
U.S. Cl. 340—551 **25 Claims**

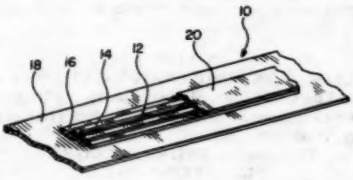


6. A process for producing a thin-film magnetic material having a magnetic thin film formed on a polymer substrate and exhibiting large Barkhausen discontinuity without intentional application of external or tensile stress on use, the magnetic thin film being formed by sputtering on a substrate during which the normal line of the substrate is directed obliquely to a target plate.

5,181,021
RESPONDER TARGET FOR THEFT DETECTION APPARATUS

J. Kelly Lee; Svetlana Reznik, and Matthias H. Regelsberger, all of Rochester, N.Y., assignors to Eastman Kodak Co., Rochester, N.Y.

Division of Ser. No. 640,744, Jan. 14, 1991. This application Oct. 7, 1991, Ser. No. 772,752
Int. Cl.[5] G08B *13/14*; B05D *5/12*
U.S. Cl. 340—572 **5 Claims**



1. A deactivatable responder target for use in magnetic security systems, comprising:

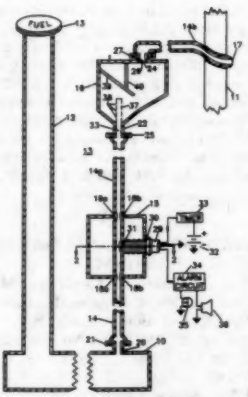
a. a signal element of material having a high permeability and low coercivity;

b. a control element comprising ferric oxide particles having the formula Fe_3O_4 dispersed in a polymer binder, and having a coercivity Hc in the range of 50 to 150 Oe.

5,181,022
APPARATUS FOR USE IN REFUELING MARINE TANKS

Alfred Schupp, 110 Navesink Ave., Highlands, N.J. 07732

Filed Jan. 14, 1991, Ser. No. 640,973
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—616 **10 Claims**



10. Apparatus for use in filling a fuel tank of a boat with liquid fuel, said tank having a filling pipe and a vent pipe extending therefrom, comprising:

a reservoir housing adapted to be positioned above said tank, said housing having a vent entry port adapted to communicate with said vent pipe and a vent exit port adapted to

communicate with the atmosphere, for delaying the delivery to said exit port of fuel entering said housing via said entry port, by accumulating a quantity of fuel within the housing;

detector means for detecting the presence of liquid fuel in a portion of said vent pipe disposed above said fuel tank and below said reservoir housing, said detector means providing an output signal indicative of the presence of liquid fuel in said vent pipe portion; and

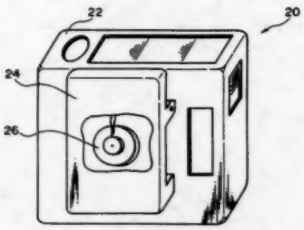
alarm means responsive to said output signal for providing a warning signal when liquid fuel moves from said tank into said vent pipe portion, and before any such fuel flows out from the exit port of said reservoir housing and spills out into the boat or the environment.

5,181,023

TERMINAL UNIT OF A MOBILE COMMUNICATION SYSTEM

Masahiro Fujii, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 31, 1990, Ser. No. 606,112
Claims priority, application Japan, Oct. 31, 1989, 1-127221[U]
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 340—825.46 **8 Claims**



1. A terminal unit of a mobile communication system having vibrating means for alerting a user of said terminal unit to an incoming call by vibration, comprising:

a vibration source included in said vibrating means, said vibration source being mounted on a belt clip of said terminal unit, said belt clip comprising a flat body having a predetermined thickness, and a vibration source retaining portion being provided at one of two opposite major surfaces of said flat body for retaining said vibration source on said belt clip, such that said vibration source is positioned, when the user wears said terminal unit, at a portion of said terminal unit closest to said user's body.

5,181,024

BOOK TYPE WIRELESS REMOTE CONTROL APPARATUS

Hideo Tsunoda, Numazu, and Yoshihiro Ichikawa, Fujinomiya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 441,607, Nov. 27, 1989, abandoned.
This application Mar. 13, 1991, Ser. No. 668,726
Claims priority, application Japan, Nov. 30, 1988, 63-302445
Int. Cl.[5] H04N *5/44*
U.S. Cl. 340—825.690 **5 Claims**

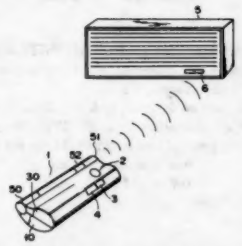
1. A wireless remote control apparatus for controlling an appliance having operating conditions, the apparatus comprising:

first and second case means each having a portable size and providing first operating portions, disposed on inner surfaces thereof, and second operating portions disposed on an outer surface of one of said first and second case means, for selectively setting operation conditions of said appliance;

movable joint means, having an opening/closing support, for connecting said first and second case means to form a book type case which can be freely opened/closed while said first operation portions which are disposed on the inner surfaces of said first and second case means oppose each other;

transmitting means, disposed in said opening/closing support of said movable joint means, for radio-transmitting transmission data representing said set operating conditions from said first and second operation portions; and

indicating means which includes a cylindrical transparent member and a light-emitting device disposed inside said cylindrical transparent member and is disposed at said movable joint means, for indicating an operation state of



said transmitting means when said transmitting means transmits said transmission data,

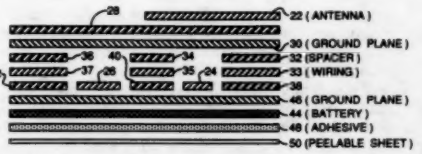
wherein said indicating means indicates an operation state of said transmitting means by light emitted from said light-emitting device radiating through said cylindrical transparent member to the outside thereof, both when a user operates said first operation portion disposed on the inner surfaces of said first and second case means in a state where said book type case is open, and when the user operates said second operation portion disposed on the outer surface of said first and second case means in a state where said book-type case is closed.

5,181,025

CONFORMAL TELEMETRY SYSTEM

Dennis D. Ferguson, St. Paul, and Gary D. Havey, Maplewood, both of Minn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 24, 1991, Ser. No. 705,472
Int. Cl.[5] G08C *19/16*
U.S. Cl. 340—870.21 **1 Claim**



1. A thin, flexible, conformal package for a telemetry system for sensing and transmitting data relative to a device under test, thickness of said entire package being less than one-eighth inch and being flexibly conformable to a curved surface, said package comprising:

an essentially planar, flexible microstrip patch printed circuit antenna

a very thin copper ground plane for said antenna, said antenna being insulatedly spaced from and adhered to said ground plane by an adhesive dielectric coating;

a telemetering circuit intended when energized for supplying RF signals to said antenna for transmission to a remote location, said telemetering circuit including sensors, data acquisition components, a controller, and RF transmitter

integrated into an essentially planar printed circuit, the upper and lower planar surfaces of said circuit being insulated with a thin film of dielectric material;

a plurality of sensors, said sensors and said telemetering circuit being integrated onto a planar, printed, integrated circuit layer;

a thin, flat battery adhered to said layer;

a metallic ground plane between said layer and said battery;

dielectric spacers between said ground plane and said layer;

an adhesive on said battery for adhering said system to a device to be tested; and

a peelable plastic sheet protecting the adhesive on said battery prior to adhering said battery to said device.

5,181,026

POWER TRANSMISSION LINE MONITORING SYSTEM

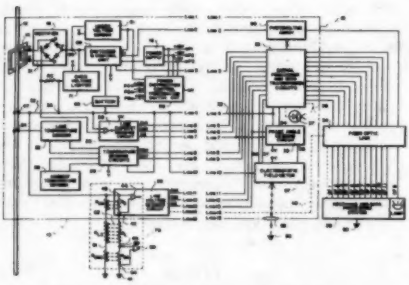
J. Michael Granville, Saugus, Calif., assignor to Granville Group, Inc., The, Saugus, Calif.

Continuation-in-part of Ser. No. 464,707, Jan. 12, 1990, Pat. No. 5,006,846. This application Dec. 19, 1990, Ser. No. 632,249

The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.

Int. Cl.[5] H04B *9/00*

U.S. Cl. 340—870.28 **44 Claims**



1. A power transmission line monitoring system comprising;

current sampling means for sampling current on a power transmission line;

rectifying means for rectifying the output of said current sampling means;

power supply means connected to the output of said rectifying means for producing regulated filtered electrical power;

line voltage sensing means connected to said power transmission line, said line voltage sensing means including a voltage divider comprised of a small resistance connected to said power transmission line in series with a very large resistance connected to earth ground;

signal processing means for receiving and processing the data output of said line voltage sensing means, signal processing means including data processing and data transmission means for transmitting said data output of said line voltage sensing means across the line to ground voltage gradient to a ground receiving and data processing station located remotely from said power transmission line, said data transmitting means comprising a fiber optic data transmission cable that includes said very large resistance of said voltage divider;

voltage divider current loss measuring circuit means for measuring current loss across said voltage divider by the continuous measurement and comparison of the current magnitude at the power line end of said line voltage sensing voltage divider with the current magnitude at the earth ground end of said line voltage sensing voltage divider, said comparison data processing performed at said ground receiving and data processing station, said voltage divider power line end current magnitude measured by said line voltage sensing means, and said voltage divider earth ground end current magnitude measured by a voltage divider earth ground end current sensing circuit means, said voltage divider earth ground end current sensing circuit means being part of said ground receiving and data processing station; and

a common system return connecting said current sampling means, said rectifying means, said power supply means, said line voltage sensing means, and said signal processing means to said power transmission line whereby system circuits are isolated from earth ground by using the power transmission line as a reference and as the common system circuitry return.

5,181,027

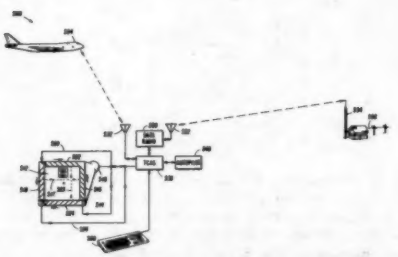
METHOD AND APPARATUS FOR AN AIR TRAFFIC CONTROL SYSTEM

Tom R. Shafer, Marion, Iowa, assignor to Rockwell International Corporation, Seal Beach, Calif.

Continuation-in-part of Ser. No. 469,624, Jan. 24, 1990, abandoned. This application Jul. 12, 1991, Ser. No. 729,112

Int. Cl.[5] G08G *5/04*

U.S. Cl. 340—961 **1 Claim**



1. An improved air traffic control system for use on transoceanic flights of a protected aircraft having a state of operation, equipped with TCAS, the system comprising:

means for determining the relative positions of a plurality of intruding aircraft situated in space about the protected aircraft;

a display means, having a viewing surface having a center region, for graphically representing the relative positions of each of said plurality of intruding aircraft with respect to said protected aircraft, the protected aircraft being represented on said viewing surface by a fixed reference character disposed in said center region, each of the plurality of intruding aircraft being represented by a different signal reference mark on said viewing surface;

a pressure sensitive touch screen interactive display device disposed about said viewing surface so that, a selection signal is generated when a human finger is pressed against one of said reference marks on said viewing surface, said one of said reference marks corresponding directly to one of said plurality of said intruding aircraft;

means for altering said one of said reference marks on said viewing surface in response to said selection signal;

means for receiving data relating to said one of said plurality of intruding aircraft in response to said selection signal; and

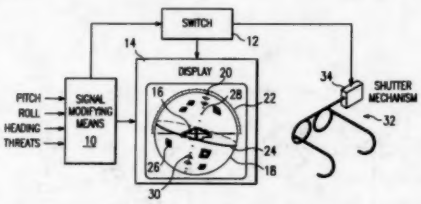
means for manipulating the state of operation of the protected aircraft in response to said selection signal so that said protected aircraft maintains a predetermined distance from said one of said intruding aircraft.

5,181,028

3D STEREO INTEGRATED ATTITUDE DIRECTOR AND HORIZONTAL SITUATION INDICATOR APPARATUS

Tom G. Sharpe; C. James Styers, both of Cedar Rapids, and James M. Suiter, Marion, all of Iowa, assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Jun. 20, 1990, Ser. No. 540,962
Int. Cl.[5] G01C *21/00*
U.S. Cl. 340—974 8 Claims



1. A 3D display for use in ascertaining an aircraft orientation comprising, in combination:

shuttered means for allowing only one eye at a time to view a display;

display means for presenting left eye and right eye presentations synchronized with said shuttered means to evoke a 3D (three dimensional) view to one wearing said shuttered means; and

signal modifying means, connected to said display means and to receive inputs of aircraft pitch, roll and heading information, for supplying left and right eye presentation signals to said display means whereby a viewer perceives,

a) a stationary aircraft symbol situated in the center of a spherical grid with the rear surface of the aircraft symbol lying in plane parallel to the surface of said display means and with the nose of the aircraft symbol extending toward the far side of the sphere,

b) a stationary roll scale lying in the same plane as the rear surface of the aircraft symbol,

c) a pitch scale which is orthogonal to the roll scale and is presented on the far side of the sphere and moves in response to the pitch motion of said aircraft with the nose of the aircraft symbol indicating the current pitch value,

d) a heading scale which is orthogonal to the pitch scale and is presented on the far side of the sphere and moves in response to the heading motion of said aircraft with the intersection of the pitch and roll scales indicating the current heading value,

e) a roll pointer which lies in the same plane as the roll scale and in line with the pitch scale and which moves in response to the roll of said aircraft to indicate the current roll value.

5,181,029

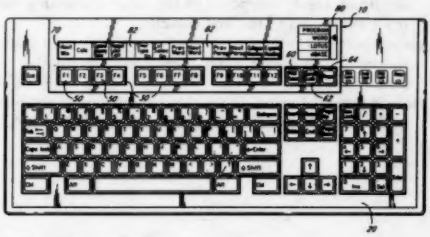
ELECTRONIC KEYBOARD TEMPLATE

Jason S. Kim, Los Angeles, Calif., assignor to AST Research, Inc., Irvine, Calif.

Filed May 13, 1991, Ser. No. 699,506
Int. Cl.[5] G09G *3/00*
U.S. Cl. 241—20 19 Claims

1. An electronic keyboard template for use with software applications programs in a computer system comprising a primary display screen, said programs being responsive to command signals transmitted by designated keys on a computer keyboard, said template comprising:

a template display screen separate from said primary display screen and positioned proximate to and aligned with said designated keys, said template display screen displaying icons representative of operations performed in response to command signals from said designated keys; and



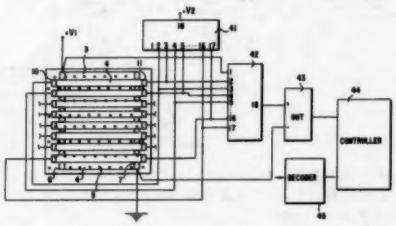
driving circuitry that generates said icons on said template display screen in response to control signals.

5,181,030

INPUT SYSTEM INCLUDING RESISTANCE FILM TOUCH PANEL AND PUSHED POSITION DETECTING DEVICE

Hisao Itaya, Moriyama; Kazuhiko Akebi, Kurita; Minoru Okabe, and Satoru Nakagawa, both of Moriyama, all of Japan, assignors to Gunze Limited, Ayabe, Japan

Filed Nov. 16, 1990, Ser. No. 614,410
Claims priority, application Japan, Dec. 28, 1989, 1-340758; Mar. 22, 1990, 2-30219[U]
Int. Cl.[5] H03K *17/94*
U.S. Cl. 341—20 9 Claims



1. An input system including a resistance film touch panel and a pushed position detecting device for detecting two-dimensional coordinates of a pushed position of a tough panel based on surface resistance values of resistance films, the system comprising:

a pair of insulating base layers opposed to each other with a certain distance therebetween;

a spacer provided between said insulating base layers for keeping said layers apart but for allowing said layers to approach each other when an external force is applied to one of said layers;

a first resistance film extended in first and second directions and provided on an inner surface of one of said layers, the first and second directions crossing each other perpendicularly and said first resistance film having outer connecting electrodes on both ends thereof along the second direction;

a plurality of second resistance films provided on an inner surface of the other of said layers, said second resistance films each being a lengthy strip extended in a direction crossing the second direction and having first and second outer connecting electrodes at both ends thereof;

first potential supplying means for supplying said first resistance film with a DC potential through one of the outer connecting electrodes of said first resistance film;

a first switch electrically connected with all the other con-

necting electrodes of said second resistance films one by one, alternately for said each second resistance film;

a second switch switched in synchronization with the first switch and electrically connected to the other connecting electrode which is opposed to the outer connecting electrode connected to the first switch;

second potential supplying means for supplying said second resistance films with a DC potential through the first switch; and

electric potential measuring means for measuring potentials of the second resistance films through the first switch.

5,181,031

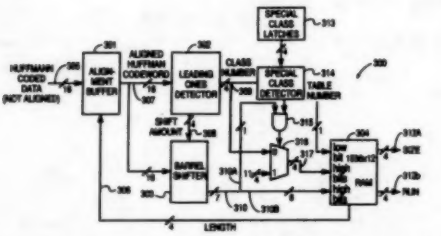
METHOD AND APPARATUS FOR DECODING HUFFMAN CODES BY DETECTING A SPECIAL CLASS

Po Tong, Fremont, and Peter Ruetz, Redwood City, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Jul. 30, 1991, Ser. No. 737,620

Int. Cl.[5] H03M *7/40*

U.S. Cl. 341—65 **12 Claims**



1. A structure for decoding a Huffman codeword, said Huffman codeword having a length no longer than w bits, said structure comprising:

a leading 1's detector for detecting a number c of leading 1's in said Huffman codeword up to a predetermined maximum no more than w and for providing a class number equal to said number c;

a first logic circuit receiving said number c and said Huffman code word for providing a remainder word of up to m bits, said remainder word being said Huffman codeword remaining after removing, for said class number less than said pre-determined maximum, c+1 bits, and for said class number equal to said predetermined maximum, c bits;

means for dividing said remainder word into a special bit and a sub-remainder word portions;

a second logic circuit receiving said special bit and said sub-remainder portions for providing a subclass number, such that when said class number does not equal a special class number said subclass number is assigned said class number, and when said class number equals said special class number, said subclass number is assigned said special class number or a predetermined value, in accordance with the value of said special bit;

means for storing decoded values of Huffman codewords; and

address decoder for mapping an address comprising first and second fields, being respectively said sub-class number and said sub-remainder word, to a location in said storage means.

5,181,032

HIGH-ORDER, PLURAL-BIT-QUANTIZATION SIGMA-DELTA MODULATORS USING SINGLE-BIT DIGITAL-TO-ANALOG CONVERSION FEEDBACK

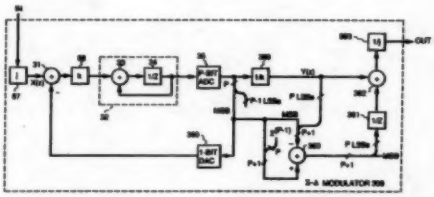
David B. Ribner, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 9, 1991, Ser. No. 756,670

The portion of the term of this patent subsequent to Jan. 28, 2009, has been disclaimed.

Int. Cl.[5] H03M *3/04*

U.S. Cl. 341—143 **14 Claims**



1. A sigma-delta modulator of N^{th} order, N being a positive number greater than one so N^{th} order is higher than first-order, said sigma-delta modulator comprising:

means for supplying an analog input signal for said sigma-delta modulator;

a network for generating an N^{th}-order response equal to a transfer function times the difference between said analog input signal and an analog feedback signal;

an analog-to-digital converter for converting said N^{th}-order response to a digitized N^{th}-order response with multiple-bit resolution;

means responsive to digitized N^{th}-order response with multiple-bit resolution for supplying a preliminary output signal for said sigma-delta modulator of N^{th} order, said preliminary output signal being related to said digitized N^{th}-order response by a scaling factor;

means for generating said analog feedback signal in response to said digitized N^{th}-order response with multiple-bit resolution;

at least one unit sample delay in the feedback loop thus formed by said network for generating an N^{th}-order response, said analog-to-digital converter and said means for generating said analog feedback signal;

a digital-to-analog converter being included in said means for generating said analog feedback signal, said digital-to-analog converter connected for converting only the most significant bit of the digitized N^{th}-order response, thereby to generate said analog feedback signal; and

means for reducing error in the preliminary output signal for said sigma-delta modulator of N^{th} order arising from said digital-to-analog converter converting only the most significant bit of the digitized N^{th}-order response, said means for reducing error comprising:

means for obtaining a digital representation of said analog feedback signal,

means for generating a correction signal equal to said transfer function times said scaling factor times a differential response to the digitized N^{th}-order response and the digital representation of said analog feedback signal, and

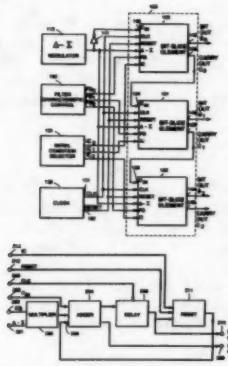
means for combining the correction signal and the preliminary output signal to generate an output signal in which there is a reduction in said error arising from said digital-to-analog converter converting only the most significant bit of the digitized N^{th}-order response to generate said analog feedback signal.

5,181,033

DIGITAL FILTER FOR FILTERING AND DECIMATING DELTA SIGMA MODULATOR OUTPUT SIGNALS

Fathy F. Yassa, Clifton Park, and Steven L. Garverick, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1992, Ser. No. 844,032
Int. Cl.[5] H03M *3/02*; G06F *15/31*
U.S. Cl. 341—143 14 Claims



1. A digital filter/decimator for filtering a bit-rate signal from a delta sigma modulator, comprising:

filter characteristic control means for selecting an arbitrary predetermined filter impulse response coefficient as a binary bit;

clock means for generating clock signals defining a clock cycle and a computation cycle; and

a plurality of bit-slice filter elements coupled in cascade and forming an accumulator for providing a binary output signal for said digital filter/decimator, each bit-slice element being responsive to said bit-rate signal and said binary bit from said filter characteristic control means, and each bit-slice element comprising:

multiplier means for multiplying said bit-rate signal and a binary bit input signal from said filter characteristic control means;

adder means for receiving a selected output signal from said multiplier means, a signal representing a previous accumulation result for said each bit-slice element, and a carry output signal from a preceding bit-slice element, for generating a carry output signal and an accumulation result output signal;

delay means coupled to receive said accumulation output signal and responsive to said clock signals for delaying said accumulation result output signal by one clock cycle; and

reset means responsive to said clock means for providing said previous accumulation result to said adder means and for clearing said accumulator and setting an initial condition upon termination of each computation cycle.

5,181,034

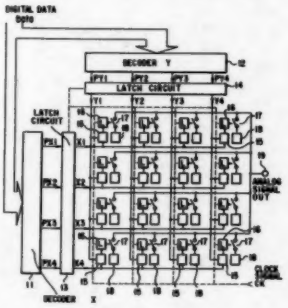
DIGITAL TO ANALOG CONVERTER

Hiroshi Takakura, Kawasaki; Akira Yamaguchi, and Tetsuya Iida, both of Yokohama, all of Japan, assignors to Kabushiki Kaishi Toshiba, Kanagawa, Japan

Filed Apr. 29, 1992, Ser. No. 875,646
Int. Cl.[5] H03M *1/66*, *1/76*
U.S. Cl. 341—144 10 Claims

1. A digital to analog converter comprising:

a decoder arranged in X and Y directions, for receiving input digital data and outputting decoded outputs corresponding to said input digital data; and



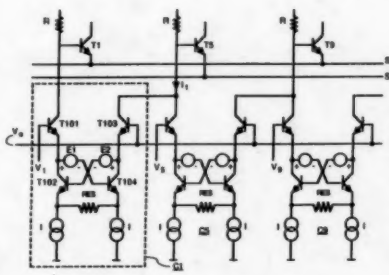
a plurality of unit cells arranged in a matrix form, for outputting analog data according to said decode outputs of said decoder, and each of which includes a latch circuit for latching predetermined outputs of said decoded outputs.

5,181,035

INTERPOLATION ANALOG/DIGITAL CONVERTER

Michel Mouret, Jarry, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Aug. 21, 1991, Ser. No. 748,213
Claims priority, application France, Aug. 21, 1990, 90 10739
Int. Cl.[5] H03M *1/38*
U.S. Cl. 341—161 7 Claims

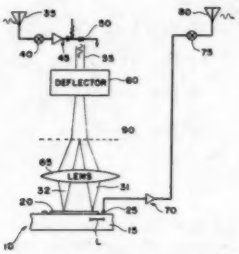


1. An N-bit interpolation analog/digital circuit comprising a first stage of comparators, the outputs of which are combined into a plurality of groups, wherein a signal periodically varying between high and low levels is formed at the combined output of each group; the output signals of each group being compared, close to their zero crossings, in second stages of comparators, wherein each comparator of the first stage is a high linearity comparator comprising two legs each comprising a first and a second transistor, the base of the second transistor of each leg being connected at the junction node of the transistors of the other leg through a voltage shifting means, and the emitters of the second transistors of each leg being interconnected through a resistor.

5,181,036
FALSE RETURN SIGNAL APPARATUS

Robert L. Miler, Bowie, and Irwin J. Abramovitz, Baltimore, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 13, 1992, Ser. No. 819,901
Int. Cl.[5] G01S *7/38*
U.S. Cl. 342—15 **8 Claims**

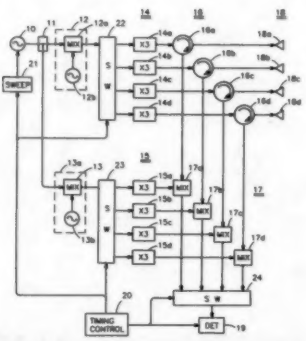


1. A false return signal apparatus, comprising:
receiver means for receiving radar signals and for generating light responsive to the received radar signals;
deflector means for variably deflecting the light across a predetermined area; and
an acoustic charge transport device positioned in the predetermined area and having an output connected to provide a false return signal responsive to the light received from the deflector means.

5,181,037
FM RADAR SYSTEM

Satoru Komatsu, Suginami, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1992, Ser. No. 835,226
Claims priority, application Japan, Feb. 15, 1991, 3-42979
Int. Cl.[5] G01S *13/93, 13/536, 13/60*
U.S. Cl. 342—70 **15 Claims**

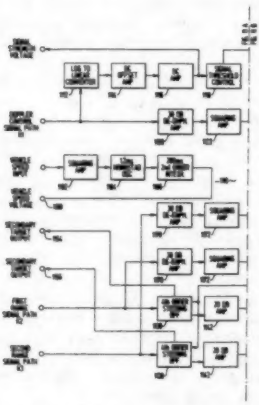


1. AN FM radar system for measuring a range and a direction to a target comprising:
at least one pair of antennas, each antenna of each pair having substantially the same directivity, each antenna being set to radiate a beam in a slightly different direction from the beam radiated by the other antenna, and each antenna being set to receive a return beam, said return beam comprising a beam radiated by the antenna and reflected by a target;
a first signal distributing means for distributing an FM signal having a frequency varying with time to each of said antennas successively and repeatedly;
a second signal distributing means for distributing a reference FM signal having a different frequency from that of said FM signal, and the difference being caused by shifting both frequencies by different amounts or delaying both signals by different amounts;
means for successively and repeatedly generating beat signals, each beat signal having a frequency, said beat signal generating means having a first and second set of input terminals, said first set of input terminals being adapted to receive a signal indicative of said return beam, and said second set of input terminals being adapted to receive said reference FM signal from said second signal distributing means;
means for detecting the frequency of at least one of said generated beat signals and converting the frequency to provide an indication of a range to said target; and
means for detecting a ratio of levels of the beat signals and converting the ratio to provide an indication of a direction to said target.

5,181,038
TARGET PERSISTENCE FILTER FOR MULTI-FREQUENCY AUTOMOTIVE RADAR SYSTEM

Jimmie Asbury, San Diego, and John W. Davis, Encinitas, both of Calif., assignors to IVHS Technologies, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 695,951, May 6, 1991. This application Aug. 16, 1991, Ser. No. 745,928
Int. Cl.[5] G01S *13/93, 13/62*
U.S. Cl. 342—70 **8 Claims**



1. In an automotive collision avoidance system in a vehicle having a Doppler radar system with means for successively transmitting a radar beam at a plurality of successive intervals and for receiving echo signals corresponding to the plurality of successive intervals from at least one target within the radar beam, a target persistence and environment filter comprising:
a. means for receiving a first and a second echo signal from at least one target, and for generating a signal indicative of the relative phase difference between the first and the second received echo signals, such relative phase difference corresponding to a change in relative distance of such at least one target with respect to the vehicle, the generated signal having a first value when such relative distance is decreasing and a second value when such relative distance is increasing;
b. persistence determination means, coupled to the generated signal, and including a programmable time delay means for determining a time period in accordance with a programmed value, for generating an output signal having

a first value if the generated signal has its first value for the time period determined by the programmed value of the time delay means, and having a second value if the generated signal has its second value during the time period determined by the programmed value of the time delay means;

c. speed determination means, for determining the speed of the vehicle; and

d. programming means, coupled to the persistance determination means and to the speed determination means, for programming the time delay means with a value whereby the duratin of the time period is proportional to the speed of the vehicle.

5,181,039

SYSTEM FOR SENSING THE APPROACH OF A MOVING MISSILE TO A TARGET

Gordon K. A. Oswald, Huntingdon; Christopher S. Neal, Cambridgeshire, and Alan T. Richardson, Cambridge, all of United Kingdom, assignors to Cambridge Consultants Limited, Cambridge, United Kingdom

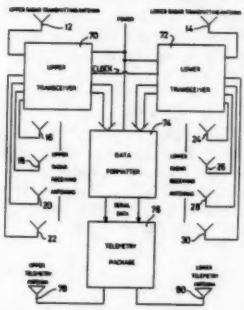
PCT No. PCT/GB90/00602, § 371 Date Sep. 16, 1991, § 102(e) Date Sep. 16, 1991, PCT Pub. No. WO90/13048, PCT Pub. Date Nov. 1, 1990

PCT Filed Apr. 20, 1990, Ser. No. 768,402

Claims priority, application United Kingdom, Apr. 22, 1989, 8909195

Int. Cl.[5] G01S *13/18*

U.S. Cl. 342—119 **9 Claims**



1. A system for sensing the approach of a moving missile to a target, comprising transmitting means on the target for transmitting a succession of transmit pulses, receiving means on the target for receiving the pulses reflected by the missile, gating means on the target for sampling the reflected pulses received at the receiving means during a succession of time windows each of which is delayed with respect to the time of transmission of a corresponding transmit pulse by a predetermined time delay corresponding to the pulse travelling a predetermined distance from the transmitting means to the missile and thence back to the receiving means, so that sampled signals from the receiving means are indicative of the missile entering or leaving a notional envelope surrounding the target at a range corresponding to said predetermined time delay, processing means which are responsive to the sampled signals and which compute the approach of the missile, and pulse generating means included in the transmission means, for generating said transmit pulses, each of which commences, from a level of no significant transmitted power in the frequency bandwidth of the pulse, with a rapid rise to a power peak and a rapid fall such that each transmit pulse consists substantially of a single radio frequency cycle and such that the sampled signals indicate reflected pulses from the missile.

5,181,040

METHOD OF MEASURING THE NULL ANGLE OF A MONOPULSE ANTENNA AND APPARATUS THEREFOR

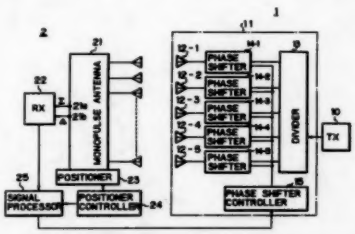
Masato Inoue; Minoru Tajima; Nobutake Orime, and Takashi Katagi, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 22, 1990, Ser. No. 601,264

Claims priority, application Japan, Dec. 13, 1989, 1-323441

Int. Cl.[5] G01S *13/44, 7/36*

U.S. Cl. 342—149 **18 Claims**



1. A method of measuring an angular direction of null in the difference vs. sum signal pattern of a monopulse antenna, comprising the steps of:

transmitting a predetermined RF signal from an array antenna including a plurality of antenna elements having a predetermined phase relationship to said monopulse antenna;

receiving the RF signal at said monopulse antenna;

acquiring difference and sum signals which said monopulse antenna produces in each direction of the respective antenna elements;

computing a ratio of the difference signal to the sum signal acquired in each of the directions of the respective antenna elements; and

obtaining the null angle in the difference vs. sum signal pattern of said monopulse antenna in accordance with computed ratios,

wherein said array antenna comprises phase shifters connected respectively to said antenna elements and a controller for causing desired amounts of phase shift to be set in said phase shifters, said steps of transmitting a predetermined RF signal and of acquiring sum and difference signals further including the steps of

adjusting the amount of phase shift set in each of said phase shifters in turn from the first to the last phase shifters and transmitting an RF signal from said array antenna each time the amount of phase shift is changed;

receiving the transmitted RF signal at said monopulse antenna and acquiring the difference signal output from said monopulse antenna in each of the directions of said respective antenna elements;

transmitting a second RF signal from said array antenna; and

receiving the second RF signal at said monopulse antenna and acquiring the sum signal of said monopulse antenna in each of the directions of said respective antenna elements.

5,181,041

ACCURATE LOCATION SYSTEM USING TRANSPONDED AND CORRELATED LORAN SIGNALS

Harold V. Lind, Sun City West, Ariz.; Walter R. Fried, and Jacob L. Bricker, both of Santa Ana, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 2, 1991, Ser. No. 724,694

Int. Cl.[5] G01S *3/02*

U.S. Cl. 342—453 **11 Claims**

1. A position location system for locating the position of a tracked unit comprising:

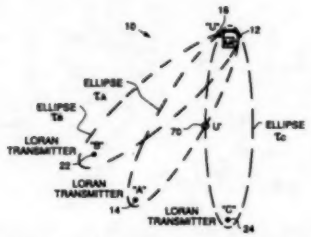
first and second means for transmitting first and second signals at a first frequency, respectively, said first means

and said second means being located remotely from each other;

master means for receiving and storing said first and second signals from said first and second transmitting means, said master means being located remotely from said first and second means for transmitting;

second means for receiving said first and second signals from said first and second transmitting means, said second means being located at said tracked unit, said second receiving means converting said first and second signals to third and fourth signals at a second frequency and transponding said third and fourth signals to said master receiving means, said master receiving means converting said third and fourth signals to said first frequency; and

correlation detection means located within said master receiving means for cross-correlating said transponded third and fourth signals with said stored first and second signals for determining the additional times of flight (τ) of said third and fourth signals transponded to said master receiving means wherein the locus of points of constant (τ) form first and second ellipses associated with each of said first and second signals, respectively, with one of a plurality of intersections of said ellipses defining the position of said tracked unit.



5,181,042

MICROSTRIP ARRAY ANTENNA

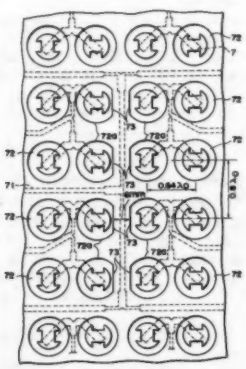
Atsushi Kaise; Naoya Hirohara, both of Ohmiya; Hiroshi Kasahara, Kawaguchi; Iichi Wakou, Ohmiya, and Yoichi Kaneko, Tokorozawa, all of Japan, assignors to Yagi Antenna Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 341,767, Apr. 21, 1989, abandoned. This application Aug. 12, 1991, Ser. No. 745,272

Claims priority, application Japan, May 13, 1988, 63-116360; Jun. 24, 1988, 63-156530

Int. Cl.[5] H01Q *1/38, 21/06*

U.S. Cl. 343—700 MS **3 Claims**



1. A planar microstrip array antenna with beam tilt, comprising an array, formed of a plurality of circularly polarized wave radiating elements each of which includes a circular feeding patch having a pair of diametrically opposed notches, and a feed line coupled to the radiating elements, wherein

said circularly polarized wave radiating elements are grouped into a plurality of pairs, one radiating element in each said pair being oriented with respect to said notches at a rotational angle $\alpha°$ to the other radiating element, within the plane of the planar antenna;

said feed line is provided with a plurality of pairs of terminal feeding portions corresponding individually to the pairs of circularly polarized wave radiating elements, said terminal feeding portions for each said pair of radiating elements diverging individually from a first diverging portion and being equal in electrical length;

said feed line is further provided with additional feeding portions connecting the first diverging portions of adjacent pairs of radiating elements to an additional diverging portion, one of the additional feeding portions including a phase shift portion;

said angle $\alpha°$ is set so as to satisfy an equation given by

$$\theta \simeq \sin^{-1}(\alpha° \lambda_o / 2\pi d),$$

where θ is a desired beam tilt angle, d is the distance between the circularly polarized wave radiating elements in each pair, and λ_o is the wavelength of electromagnetic waves within a free space; and

wherein a group of radiating elements which, among said plurality of circularly polarized wave radiating elements, are situated most closely adjacent to the feed line configurations partially include straight edge portions on the sides thereof proximate to the feed line, whereby the gap between each said circularly polarized wave radiating element and the feed line is maintained.

5,181,043

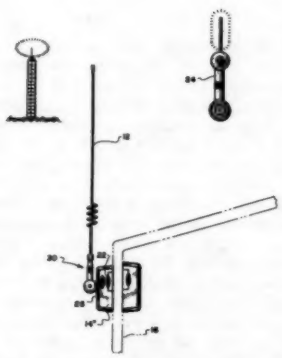
PASSIVE REPEATER FOR CELLULAR PHONES

Gershon N. Cooper, Encino, Calif., assignor to Alliance Research Corporation, Chatsworth, Calif.

Continuation of Ser. No. 527,181, May 22, 1990, abandoned. This application Dec. 20, 1991, Ser. No. 812,872

Int. Cl.[5] H01Q *1/32*

U.S. Cl. 343—713 **8 Claims**



1. A passive repeater assembly for use with a transceiver located within a shielding environment that has areas that are transparent to wireless electromagnetic radiation, comprising in combination:

a) a first antenna, including a radiator having an axis, said first antenna being mounted to the exterior of the shielding

environment in one of the radiation transparent areas thereof;

b) a second antenna connected to said first antenna and orthogonally displaced therefrom mounted exterior to the shielding environment, and in electromagnetic radiant transmission and reception communication with the transceiver; and

c) means for electrically coupling said second antenna with said first antenna radiator,

whereby a transceiver antenna directly radiates energy within the shielding environment without a wire link to said second antenna, and by means of said radiator, the transceiver communicates with remote transmitters and receivers that are in radiant energy communication with said radiator.

5,181,044

TOP LOADED ANTENNA

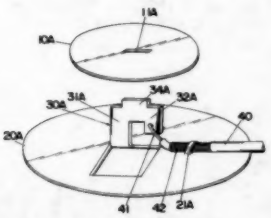
Kazuhiro Matsumoto, Hirakata; Masayuki Matsuo, Neyagawa, and Naoyuki Noda, Hakusan, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Nov. 13, 1990, Ser. No. 611,498

Claims priority, application Japan, Nov. 15, 1989, 1-132803[U]; Nov. 15, 1989, 1-297079; Aug. 8, 1990, 2-84423[U]; Aug. 8, 1990, 2-210840

Int. Cl.[5] H01Q *9/00, 1/32*

U.S. Cl. 343—752 **15 Claims**



1. A top-loaded antenna comprising:

a top load plate;

a ground plate spaced from said top load plate; and

a matching element integrally provided with feedline means and shortline means, said matching element coupling said top load plate to said ground plate, said matching element being made in the form of a printed board with conductive patterns which define said feedline means and said shortline means, said feedline means terminating with one end spaced from said ground plate to define thereat a coupling end for physical and electrical connection to a feed cable.

5,181,045

BLEED ALLEVIATION USING PH-SENSITIVE DYES

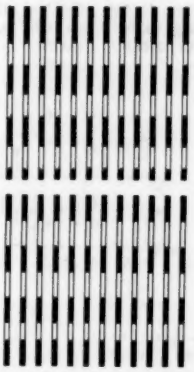
James P. Shields, and Raymond J. Adamic, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 23, 1991, Ser. No. 764,014

Int. Cl.[5] B41J *2/21;* **C09D** *11/02*

U.S. Cl. 346—1.1 **6 Claims**

1. A method of reducing bleed in printing at least two different colors on a print medium from an ink-jet pen, comprising printing a first ink containing a dye that is sensitive to pH and



printing a second ink having an appropriate pH to cause said dye of said first ink to precipitate out on said print medium.

5,181,046

THERMAL HEAD

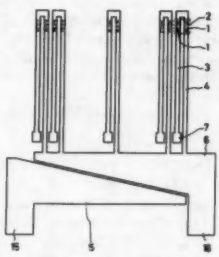
Yoshiaki Saita; Seiji Kuwahara, and Yoshinori Sato, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Jan. 9, 1991, Ser. No. 639,665

Claims priority, application Japan, Jan. 9, 1990, 2-1931

Int. Cl.[5] B41J *2/345;* **H04N** *1/024*

U.S. Cl. 346—76 PH **20 Claims**



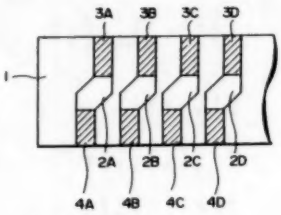
1. A thermal head comprising: a plurality of heating elements grouped into blocks, each heating element having a pair of first and second lead electrodes arranged to extend in a same direction from the heating element; a plurality of switching elements connected to corresponding first lead electrode; a first common electrode disposed within each block to connect to the first lead electrodes through the switching elements; and a second common electrode disposed adjacently to the first common electrode within a same block to connect to the second lead electrodes, wherein the first and second common electrode are patterned in a generally similar shape having gradually varying width and are arranged lengthwise reversely to each other, and wherein the second lead electrodes are connected to a widthwise side of the second common electrode.

5,181,047

THERMAL HEAD

Katsunari Sasaki, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 12, 1990, Ser. No. 507,886
Claims priority, application Japan, Apr. 14, 1989, 1-94895
Int. Cl.[5] B41J *2/335;* **H04N** *1/032*
U.S. Cl. 346—76 PH **12 Claims**



1. A thermal head comprising:

a plurality of heating resistors arranged in a horizontal scanning direction, each one of the plurality of heating resistors having a first end portion, a second end portion, and a central heating portion, said central heating portion having a predetermined width in the horizontal scanning direction;

a plurality of first lead electrodes, each one of the plurality of first lead electrodes having a first and second edges extending in a direction that intersects the horizontal scanning direction and being connected to a first end portion of a corresponding one of the plurality of heating resistors to form a first abutment;

a plurality of second lead electrodes, each one of the plurality of second lead electrodes having first and second edges extending in a direction that intersects the horizontal scanning direction and being connected to a second end portion of a corresponding one of the plurality of heating resistors to form a second abutment, each one of the plurality of second lead electrodes being offset from a corresponding one of the plurality of first lead electrodes in the horizontal scanning direction;

wherein said first abutment formed between each one of the plurality of heating resistors and a corresponding one of the plurality of first lead electrodes and said second abutment formed between each one of the plurality of heating resistors and a corresponding one of the plurality of second lead electrodes have a width less than the predetermined width.

5,181,048

PREHEATED THERMAL PRINT APPARATUS FOR VIDEO PRINTER

Dong-il Cha, Kyunggi-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Filed Aug. 30, 1991, Ser. No. 753,389
Claims priority, application Rep. of Korea, Aug. 31, 1990, 90-13676
Int. Cl.[5] B41J *2/38*
U.S. Cl. 346—76 PH **18 Claims**

1. A preheated thermal print apparatus for a video printer having a thermal print head, comprising:

an input port for inputting video data on a line-by-line basis;

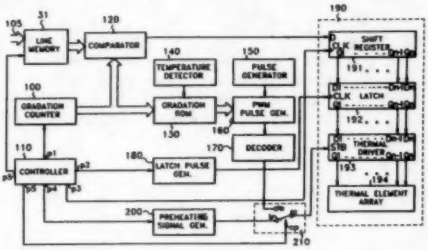
a memory for temporarily storing single lines of video data among the video data received via said input port;

a gradation counter for generating an output by counting a print level designation value to sequentially designate gradations to be printed;

a comparator for comparing the output of said gradation counter with the video data from said memory to produce print signals, and for supplying said print signals to said thermal print head;

thermal element driving signal generating means for generating a thermal element driving signal corresponding to the output of said gradation counter;

a controller for controlling said memory, said gradation counter and the thermal print head, thereby enabling generation of a fundamental energy for sublimating dye materials by said thermal print head during a line memory period while each line of video data in stores in said memory; and



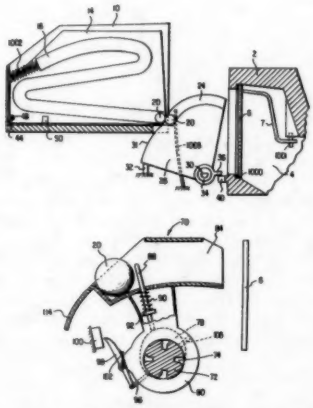
a control switch for responding to said controller by enabling transmission of one of said thermal element driving signal and said fundamental energy to the thermal print head.

5,181,049

PHASE CHANGE INK REPLENISHMENT SYSTEM

Donald Mackay, Calabasas; Joseph Paul, Lancaster, and Greg Goble, Tujunga, all of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed Nov. 9, 1989, Ser. No. 433,716
Int. Cl.[5] G01D *15/16;* **B65H** *3/30*
U.S. Cl. 316—140 R **13 Claims**



1. In a color printer including print head means for effecting printing with a phase change ink and provided with a plurality of reservoirs each for holding a supply of ink of a respectively different color, the improvement comprising: ink storage means removably held in the printer for storing a plurality of pellets of ink in solid phase, said ink storage means being composed of a plurality of storage devices, each of the storage devices having an outlet and a supply channel for storing a plurality of pellets of ink of a respectively different color in solid phase and for supplying the pellets to said outlet at least in part by gravitational force; pellet conveying means disposed between said storage device outlets and said reservoirs of said

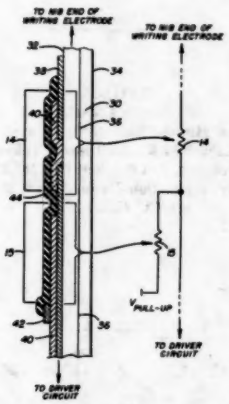
print head means and movable between a receiving position for receiving at least one pellet from a storage device outlet and a delivery position for conveying a pellet received in the receiving position to a reservoir of said print head means; drive means coupled to said pellet conveying means for moving said pellet conveying means between said receiving and delivery positions; and selecting means operatively associated with said pellet conveying means for selecting a pellet of ink of a given color for conveyance by said conveying means to a corresponding reservoir, wherein said pellet conveying means have a plurality of pellet conveyance channels each associated with a respective storage device and a respective reservoir.

5,181,050

METHOD OF FABRICATING AN INTEGRATED THICK FILM ELECTROSTATIC WRITING HEAD INCORPORATING IN-LINE-RESISTORS

Andreas Bibl, Los Altos, and George H. Fellingham, San Jose, both of Calif., assignors to Rastergraphics, Inc., Sunnyvale, Calif.

Division of Ser. No. 619,256, Nov. 28, 1990, which is a continuation-in-part of Ser. No. 410,594, Sep. 21, 1989, Pat. No. 4,977,416. This application Jan. 10, 1992, Ser. No. 819,025
Int. Cl.[5] G01D *15/06;* **H01R** *43/00;* **B44C** *1/22;* **B29C** *37/00*
U.S. Cl. 346—155 **19 Claims**



1. A method for forming an electrographic writing head from a single planar substrate having opposite major surfaces including an array of writing nibs, a corresponding high impedance nib resistor and high voltage pull-up resistor associated with each nib of said array of writing nibs disposed on each of said opposite surfaces of the substrate comprising the steps of:

providing at least one shielding means internally within the body of said substrate extending parallel to the plane of said substrate for shunting electric field lines to ground;

providing an array of substantially parallel metal traces over each opposite surface of said substrate;

providing a first layer of dielectric polymer over said metal traces;

providing a second layer of conductive polymer over said dielectric polymer;

providing a third layer of insulating polymer over said conductive polymer;

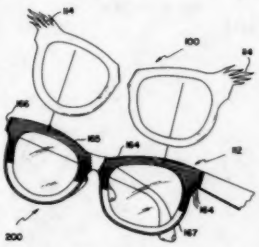
selectively removing portions of said first, second and third polymer layers such that the remaining portions of said polymer layers form a nib and a pull-up resistor each having a connection with a corresponding one of said metal traces.

5,181,051

MAGNETIC REMOVABLE DISPLAY FOR EYEGLASSES

Daniel R. Townsend, 8 Lombardy Pl., Towson, Md. 21204, and William D. White, Gibson Island, Md., assignors to Daniel R. Townsend, Towson, Md.

Filed Jan. 17, 1991, Ser. No. 642,467
Int. Cl.[5] G02C *11/02*
U.S. Cl. 351—52 **22 Claims**



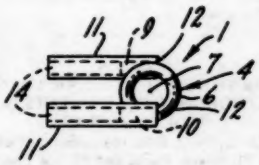
20. The removable display for use with a pair of specified metal glasses according to claim 17, wherein said display extends along said frame and along said temples.

5,181,052

EYEGLASS RETAINER

Bingham A. McClellan, 43 Forest La., Eustis, Fla. 32726

Filed Feb. 4, 1991, Ser. No. 650,099
Int. Cl.[5] G02C *3/00*
U.S. Cl. 351—156 **7 Claims**



1. An eyeglass retainer comprising:

A. an integral resilient flexible circular member having a uniform exterior diameter, said member being wound into a coil of substantially identical circular loops aligned along a common central axis, each of said loops touching its adjacent loop or loops continuously over its entire extent when said coil is unexpanded by an eyeglass wearer, said member having cylindrical terminal ends that extend essentially perpendicularly to said central axis, said loops being separable along said central axis so as to expand said coil, said coil being universally deformable so that said eyeglass retainer can stretch around a head of an eyeglass wearer and snugly hold such eyeglasses on such head, and said coil having a resiliency that prevents said coil from being permanently deformed during normal use and causes said coil to return to its original configuration with each of said loops touching its adjacent loop or loops continuously over its entire extent when said retainer is removed from said eyeglasses;

B. a pair of eyeglass stem connectors, each comprising a resilient flexible right circular cylindrical tube having a uniform interior diameter, each tube being open at its opposite ends so as to provide a pair of identical circular holes of the same diameter at its opposite ends; and

C. each of said cylindrical terminal ends of said members extending into one of said identical circular holes in one of said cylindrical tubes, each of said tubes completely surrounding and being bonded to the terminal end it receives, and the other of said pair of identical circular holes being

adapted to receive a terminal end of an eyeglass stem and to attach said eyeglass retainer to such terminal end by frictional contact therewith.

5,181,053

MULTI-FOCAL CONTACT LENS

Howard J. Brown, Memphis, Tenn., assignor to Contact Lens Corporation of America, Memphis, Tenn.

Filed May 10, 1990, Ser. No. 521,620
Int. Cl.[5] G02C *7/04*
U.S. Cl. 351—161 **7 Claims**

1. A multi-focal contact lens, comprising:

a lens body having a concave surface and a convex surface and a central optical zone portion confined to the center part of the lens, said optical zone portion including a spherical curve in the center region of the concave surface and an aspheric curve in the concave surface which surrounds the center spherical region, wherein said spherical curve and aspheric curve and regions surrounding the optical zone have continuous measurable power at any part on the lens.

5,181,054

DEVICE FOR THE PROJECTION OF IMAGES USING TWO ORTHOGONAL COMPONENTS OF LIGHT POLARIZATION

Christophe Nicolas, Paris; Brigitte Loiseaux, Villebon S/Yvette; Jean-Pierre Huignard, Paris, and Claude Puech, Ballainvilliers, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Aug. 2, 1991, Ser. No. 739,488
Claims priority, application France, Aug. 10, 1990, 90 10251
Int. Cl.[5] G02F *1/13*
U.S. Cl. 353—20 **19 Claims**

1. An image projector comprising:

at least one light source,

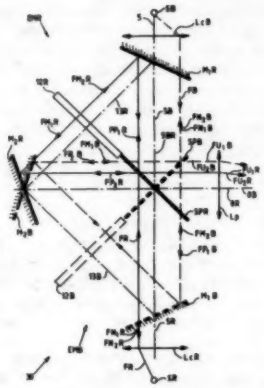
at least two light modulation sets,

at least one projection objective,

wherein each light modulation set comprises a spatial light modulator, a polarization splitter that splits the light into a first polarized beam and a second polarized beam propagating along different directions and having different and complementary polarizations,

wherein each light modulation set comprises means to superimpose the first and second polarized beams on one and the same optical axis with opposite directions of propagation, the spatial light modulator is positioned on said optical axis in order to modulate the first and second polarized beams that pass through the spatial modulator and respectively form a first modulated beam and a second modulated beam having complementary polarizations,

wherein the two modulated beams pass again through the same polarization splitter, by which they are superimposed on one another and have the same propagation direction along at least one axis, and propagate towards at least one of the projection objective and the light source, wherein relative intensities of the superimposed and modulated beams propagating respectively towards the projection objective and the light source are a function of modulation by the spatial light modulator of the first and



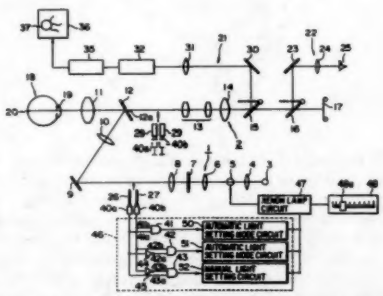
second polarized beams, wherein the polarization splitters are selective in wavelength and form imbricated and intersecting surfaces.

5,181,055

FUNDUS CAMERA

Eiichi Sano, and Hiroshi Minegishi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Topcon, Tokyo, Japan

Filed Aug. 8, 1991, Ser. No. 741,870
Claims priority, application Japan, Aug. 9, 1990, 2-211357
Int. Cl.[5] G03B *29/00*
U.S. Cl. 354—62 **7 Claims**


AUTOMATIC LIGHT SETTING MODE CIRCUIT
AUTOMATIC LIGHT SETTING MODE CIRCUIT
MANUAL LIGHT SETTING CIRCUIT
XENON LAMP CIRCUIT

1. A fundus camera which can take fluorescent photographs by infra-red light and other types of photographs, characterized in that it comprises:

detecting means for detecting whether or not the photograph being taken is a fluorescent photograph by infra-red light,

means for automatically setting the amount of light emitted by a photographic source when the photograph being taken is not a fluorescent photograph by infra-red light, and changing over to manual setting of the amount of light emitted by said photographic source when the photograph being taken is a fluorescent photograph by infra-red light, according to information provided by said detecting means.

5,181,056

IMAGE STABILIZING APPARATUS

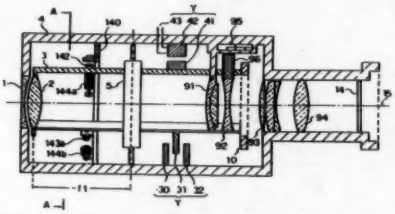
Kazuhiro Noguchi, Kawasaki; Shigeru Ogino, Tokyo, and Takashi Kobayashi, Mitaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1991, Ser. No. 706,955

Claims priority, application Japan, May 31, 1990, 2-141955; May 31, 1990, 2-141956

Int. Cl.[5] G03B *39/00*

U.S. Cl. 354—70 **16 Claims**



1. An image stabilizing apparatus which compensates image blurring by means of a compensatory optical system displaceably supported relative to a barrel, comprising:

(A) electrical locking means for electrically locking the compensatory optical means relative to the barrel;

(B) mechanical locking means for mechanically locking the compensatory optical means relative to the barrel; and

(C) control means for activating the electrical locking means prior to the activation or releasing of the mechanical locking means.

5,181,057

LENS-FITTED PHOTOGRAPHIC FILM PACKAGE

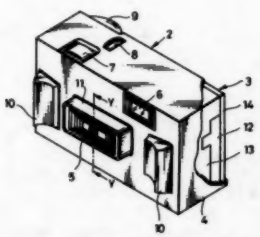
Junichi Takagi, and Norio Hirasaki, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1991, Ser. No. 667,758

Claims priority, application Japan, Mar. 9, 1990, 2-24157[U]; Mar. 9, 1990, 2-24158[U]; Mar. 9, 1990, 2-24159[U]; Mar. 9, 1990, 2-24160[U]

Int. Cl.[5] G03B *31/26*

U.S. Cl. 354—94 **17 Claims**



10. A lens-fitted photographic film package containing an unexposed photographic film and mechanism for exposing said film, said lens-fitted photographic film package further comprising:

a pair of positioning members for designating the position of fingers of a user when said lens-fitted photographic film package is handles for photographing, said positioning members being formed on a front wall of said lens-fitted photographic film package integrally therewith and projecting forwardly thereof and having forward surfaces so shaped so as to define a rest position of the fingers on said forward surfaces thereby to prevent insertion of the fingers into the photographic field, said positioning members comprising a pair of grips each having a projection and a recessed portion, said projections being spaced farther apart than said recessed portions.

5,181,058

CAMERA HAVING MAGNETIC HEAD FOR DEMAGNETIZING AND RECORDING IN DEMAGNETIZATION PATTERN

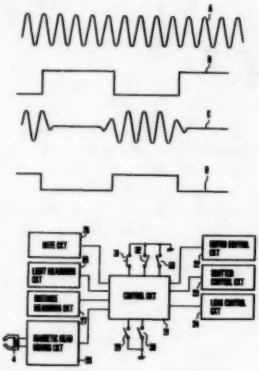
Akira Egawa, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1991, Ser. No. 641,705

Claims priority, application Japan, Jan. 19, 1990, 2-11588

Int. Cl.[5] G03B *17/24*; H01F *13/00*

U.S. Cl. 354—105 **6 Claims**



1. A camera adapted to use a film having a magnetic storage part, comprising:

a) a magnetic head arranged to demagnetize a signal pattern previously recorded in the magnetic storage part of the film; and

b) control means for causing said magnetic head to demagnetize the signal pattern previously recorded in the magnetic storage part of the film with a predetermined demagnetization pattern which is of a frequency lower than that of the signal pattern, and for forming information to be recorded in the magnetic storage part of the film in the demagnetization pattern.

5,181,059

CAMERA ADAPTOR KIT

Donald E. Mauchan, Marlborough, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 18, 1991, Ser. No. 642,850

Int. Cl.[5] G03B *15/03, 17/24*

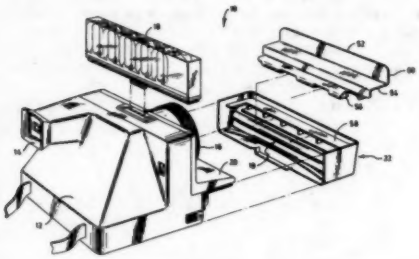
U.S. Cl. 354—108 **10 Claims**

1. A kit for use in adapting an instant camera to produce an exposed film unit having indicia imprinted along one end thereof during the exposure of the film unit, the camera including an objective lens having a field of view, a light source having a field of illumination which overlaps the field of view of the objective lens, and a housing for locating a film cassette containing a stack of film units in position for their sequential exposure via an exposure opening in a wall of the film cassette, said kit comprising:

a template having opaque portions which define indicia adapted to be reproduced on a film unit during its photographic exposure, said template being adapted to be located in superposition with an endmost film unit in this stack of film units in the film cassette; and

a reflector having a reflecting surface and means for mounting said reflector on the camera at a location between the

objective lens and a scene to be photographed with said reflecting surface facing toward the objective lens and the light source and being disposed outside of the field of view of the objective lens and within the field of illumination of the light source, whereby during the exposure of the scene a portion of the light from the light source is reflected by



said reflecting surface back into the objective lens and then through said indicia and onto the film unit to supplement the scene light passing through the indicia thus recording the indicia on the end of the film unit with an intensity greater than that which would be produced by the reflected scene light alone.

5,181,060

ELECTRONICALLY CONTROLLED CAMERA

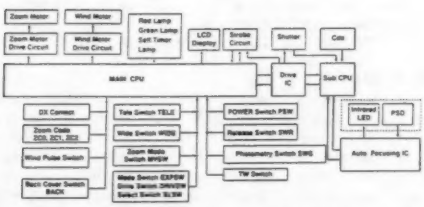
Takeo Kobayshi, Tokyo; Yasushi Tabata, Ichikawa; Norio Numako, Oaza-marubayashi, and Katsutoshi Nagai, Kawaguchi, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1991, Ser. No. 655,303

Claims priority, application Japan, Feb. 14, 1990, 2-32981

Int. Cl.[5] G03B *9/08, 9/64*

U.S. Cl. 354—238.1 **20 Claims**



1. A camera system including a control unit for controlling a camera capable of being operated in an automatic release mode in which a plurality of shootings can be automatically executed, said control unit comprising:

means for setting the number of shootings to be executed by said camera while in said automatic release mode; and

means for automatically setting an interval time between each shooting in accordance with said number of shootings to be executed.

5,181,061

CAMERA SYSTEM

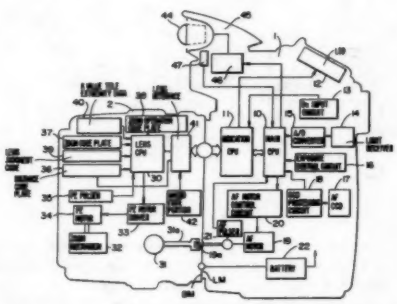
Masahiro Kawasaki; Hiroyuki Takahashi, and Shigeru Iwamoto, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1991, Ser. No. 692,716

Claims priority, application Japan, Apr. 27, 1990, 2-113699

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—400 **11 Claims**



1. A camera system for communicating data between a micro computer in a camera body and a zoom lens mounted to the camera body, wherein at least a K value representing an automatic focusing drive pulse coefficient is transmitted from said zoom lens to said micro computer in said camera body, said zoom lens comprising:

a position detecting means for detecting one of a plurality of divided focal length steps that correspond to a focal length of said zoom lens;

a K value outputting means for outputting a K value at a telephoto extremity or a wide angle extremity of said zoom lens; and,

an arithmetic operating means for calculating said K value at each focal length step in accordance with data of said position detecting means and said K value outputting means.

5,181,062

INFORMATION READING APPARATUS, CAMERA CAPABLE OF EXCHANGING SIGNALS WITH THE INFORMATION READING APPARATUS, AND MEMORY MEDIUM

Jiro Kazumi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1990, Ser. No. 530,190

Claims priority, application Japan, May 29, 1989, 1-132769; May 29, 1989, 1-132770; Jun. 15, 1989, 1-153270

Int. Cl.[5] G03B *7/00*

U.S. Cl. 354—412 **20 Claims**

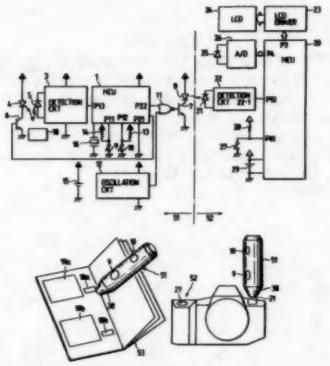
1. A camera capable of communicating with an information reading and transmitting apparatus, comprising:

(a) detecting means for detecting a signal output from the information reading and transmitting apparatus;

(b) memory means prestoring therein a plurality of programs for effecting a plurality of camera operations to achieve a desired photographic effect;

(c) selecting means for selecting a particular program from

among said plurality of programs on the basis of the result detected by said detecting means; and



(d) control means for controlling the camera operations on the basis of said particular program selected by said selecting means.

5,181,063

CAMERA SHUTTER

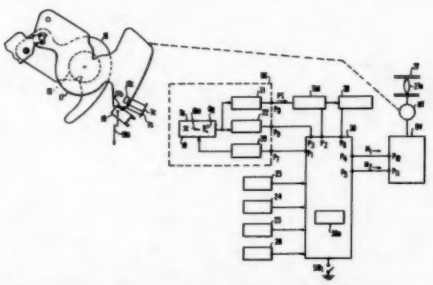
Shigeru Tagami; Kazuo Akimoto; Kanji Ito, and Katsuhiko Matsushita, all of Chiba, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1991, Ser. No. 719,875

Claims priority, application Japan, Jun. 25, 1990, 2-67124

Int. Cl.[5] G03B *7/08*

U.S. Cl. 354—435 **3 Claims**



1. A camera shutter comprising a motor, a sector for opening and closing a shutter opening in response to the rotation of the motor, said sector having a detecting section, whereby movement of said sector in response to rotation of said motor includes an initial movement prior to opening of said shutter opening, a photo-interruptor signal output means having a light emitting element and a light receiving element and actuated by a light beam traveling from said light emitting element to said light receiving element via said detecting section to output a phtoot-interruptor signal, a timer controlled to be set by the photo-interruptor signal, a timer controlled to be set by the photo-interruptor signal and reset when a given time count therein is reached, and a shutter malfunction detecting means for closing the sector during said initial movement and delivering a malfunction signal when the level of the photo-interruptor signal does not change before the timer finishes counting the given time count.

5,181,064

CAMERA SHUTTER

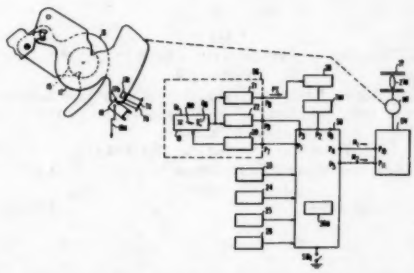
Shigeru Tagami; Kazuo Akimoto; Katsuhiko Matsushita, and Kanji Ito, all of Chiba, Japan, assignors to Seikosha Co., Ltd., Tokyo. Japan

Filed Jun. 24, 1991, Ser. No. 719,866

Claims priority, application Japan, Jun. 25, 1990, 2-67123[U]

Int. Cl.[5] G03B *7/08, 7/093*

U.S. Cl. 354—437 **6 Claims**



1. A camera shutter comprising a motor, a section having a plurality of signal edges formed in a peripheral portion thereof, said sector comprising means for opening and closing a shutter opening in response to the rotation of the motor, photo-interrupter means including light emitting and light receiving elements for delivering first and second photo-interrupter signals in response to the passage thereby of first and second, and third edges, respectively, of said plurality of signal edges of the sector, a timer, means for determining brightness of an object to be photographed, means for setting said timer to a count value corresponding to said exposure quantity and the first photo-interruptor signal, and means for controlling said timer to begin its counting operation in response to the second photo-interruptor signal, and motor driving means for driving the motor in response to the operation of the timer.

5,181,065

FLEXIBLE PRINTED BOARD FOR USE IN CAMERAS

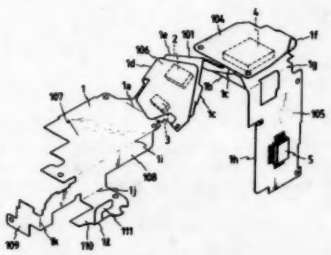
Masaharu Hara, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Aug. 28, 1991, Ser. No. 750,951

Claims priority, application Japan, Sep. 4, 1990, 2-92474[U]

Int. Cl.[5] G03B *7/00*

U.S. Cl. 354—485 **13 Claims**



1. A flexible printed circuit board for use in cameras comprising:

a component mounting portion on which are mounted one or more electronic components;

a folded-back portion which is folded back so as to overhang said component mounting portion; and

one or more shield patterns extended over at least the inner

surface of said folded-back portion in opposing relationship with said one or more electronic components and electrically grounded in order to prevent said one or more electronic components from being adversely affected by external electrical noise.

5,181,066

PAPER DEVICE AND METHOD FOR PHOTOGRAPHIC PRINTER

Yoshio Ozawa, Kanagawa; Takashi Matsumoto, and Kimitoshi Saito, both of Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

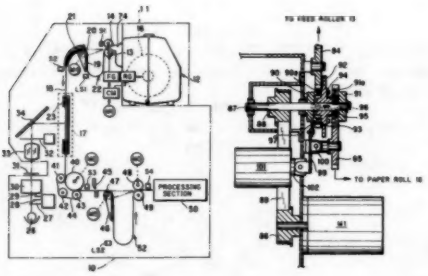
Filed May 26, 1992, Ser. No. 887,816
Claims priority, application Japan, May 24, 1991, 3-149839
Int. Cl.[5] G03B *29/00*
U.S. Cl. 355—29 **14 Claims**

1. A paper transporting device for a photographic printer, said device comprising:

a pair of feed rollers for nipping a leading end of photographic paper and pulling said photographic paper out of a paper magazine attached to said photographic printer, so as to feed said photographic paper to an exposure station, said feed rollers being disposed near said paper magazine;

a paper feed gear train operatively coupled to said feed rollers;

a paper rewind gear train operatively coupled to a winding shaft of said paper magazine, so as to rewind said photographic paper onto said winding shaft;



a motor rotating in a first direction during a paper feeding operation, and rotating in a second direction, which is reverse to said first direction, during a paper rewinding operation;

a first gear in meshing engagement with said paper feed gear train;

a second gear in meshing engagement with said paper rewind gear train;

a pin-clutch mechanism coupled to said motor so as to transmit the rotation of said motor alternatively to one of said first and second gears; and

control means for controlling said motor and said pin-clutch mechanism.

5,181,067

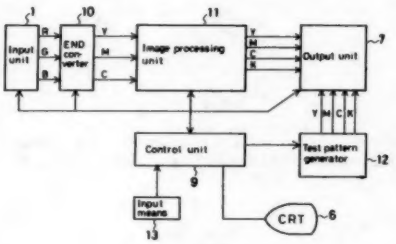
Patent Not Issued For This Number

5,181,068

METHOD FOR DETERMINING AMOUNTS OF UCR AND IMAGE PROCESSING APPARATUS

Seiichiro Morikawa, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 24, 1992, Ser. No. 825,492
Claims priority, application Japan, Jan. 30, 1991, 3-9554
Int. Cl.[5] G03B *27/32*
U.S. Cl. 355—77 **14 Claims**



1. A method for determining amount of UCR (under color removal), characterized in that:

gray balance is set at a predetermined step;

test patterns in the form of a matrix are printed according to said set gray balance;

density of said test patterns in the form of a matrix is measured; and

the UCR amount is determined according to said measured density.

5,181,069

METHOD AND APPARATUS FOR REWIRING CORONA WIRE CARTRIDGE

John A. Oleksinski, Libertyville, and Earl D. Hedberg, Gurnee, both of Ill., assignors to Station Eight, Inc., Waukegan, Ill.

Continuation-in-part of Ser. No. 555,904, Jul. 23, 1990, Pat. No. 5,140,367. This application Sep. 16, 1991, Ser. No. 759,614
Int. Cl.[5] G03B *00/00*
U.S. Cl. 355—133 **3 Claims**

1. A method for replacing a corona wire in a corona wire cartridge of the type including a generally rectangular frame having opposed end portions, a hollow interior portion, and a

pair of corona wire mountings with one mounting adjacent each end portion, and a rivet positioned on each mounting

said method comprising the steps of

removing an unobstructed one of said rivets from its mounting;

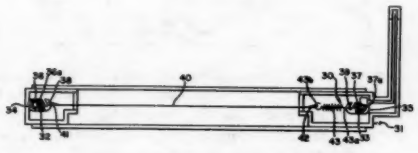
biasing an electric contact from a position obstructing the other of said rivets from its mounting;

removing the obstructed rivet from its mounting;

removing the original corona wire;

attaching a replacement rivet having an outer ridge and an inner recess thereunder on each of said corona wire mountings;

unbiasing said electrical contact;



hooking a coil spring onto a first loop end of a replacement corona wire;

engaging a second loop end of said replacement corona wire over said ridge and on said recess of one of said rivets;

pulling the coil spring until it engages the other of said rivets on said recess thereof.

5,181,070

PROCESS CARTRIDGE AND IMAGE FORMING APPARATUS USING SUCH CARTRIDGE

Toshiki Masuda, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 28, 1990, Ser. No. 619,005

Claims priority, application Japan, Nov. 29, 1989, 1-311804

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—200 **11 Claims**

1. A process cartridge removably replaceably installable in the body of an image forming apparatus, comprising:

an image bearing member rotatable in a specified direction;

a charging means including a discharge electrode and a control electrode for uniformly charging the surface of said image bearing member;

a regulating means for regulating the potential of said control electrode to a predetermined value; and

an operation change-over means for cooperating with an actuating means mounted on said body and rendering said regulating means operative or inoperative according to an

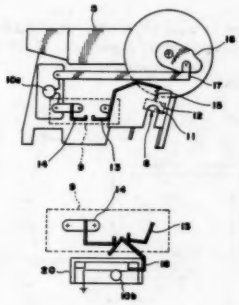


image forming velocity set for said image forming apparatus.

5,181,071

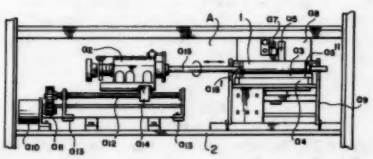
APPARATUS FOR EVALUATING CHARACTERISTICS OF PHOTOSENSITIVE DRUM FOR ELECTROPHOTOGRAPHY

Satoshi Nakajima; Kouichi Mochizuki; Hiroki Kobayashi, and Yuji Kohno, all of Kofu, Japan, assignors to Yamanashi Electronics Co., Ltd., Yamanasii and Shindengen Electric Manufacturing Co., Ltd., Tokyo, both of, Japan

Filed Dec. 2, 1991, Ser. No. 801,663

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—203 **5 Claims**



1. An apparatus for use in electrophotography, said apparatus comprising:

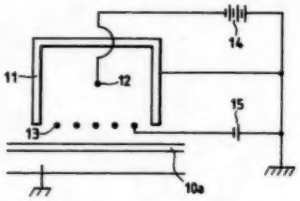
a rotatable photosensitive drum having characteristics to be measured;

a charging portion, an exposure light source portion and the like respectively secured adjacent to said photosensitive drum and arranged such that a surface potential of said drum, which is generated due to operation of the charging portion and the exposure light source portion and the like, is measured by a potential measuring probe which is fixed adjacent to a position of said photosensitive drum at which light irradiated onto said photosensitive drum by said exposure light source portion travels over a shortest distance, said drum being movable in a lengthwise direction of said photosensitive drum so that the surface potential of said photosensitive drum is measured by said potential measuring probe.

5,181,072
COLOR RECORDING APPARATUS

Nobumasa Furuya; Tsuneo Noami, and Takeshi Sumikawa, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1991, Ser. No. 733,619
Claims priority, application Japan, Aug. 3, 1990, 2-206309
Int. Cl.[5] G03G *15/02*
U.S. Cl. 355—225 **9 Claims**



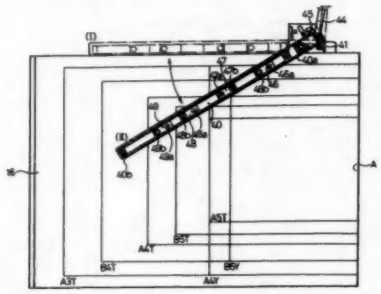
1. A color recording apparatus comprising:
first development means for developing a first latent electrostatic image with a first color toner, said first latent electrostatic image being formed on a latent electrostatic image carrier;
scorotron means, including a grid, for applying a charge to said latent electrostatic image carrier after the development of said first latent electrostatic image by said first development means, said scorotron means including:
means, responsive in the event that said charge applied by said scorotron means has the same polarity as a charging polarity of said first color toner, for setting a potential of said grid to a level equivalent to a potential of a non-image portion of said first latent electrostatic image or to a polarity opposite to a polarity of an image portion of said first latent electrostatic image with said potential of said non-image portion being regarded as the neutral polarity reference potential, and
means, responsive in the event that said charge applied by said scorotron means has a polarity opposite to said charging polarity of said first color toner, for setting said potential of said grid to a polarity opposite to a polarity of said non-image portion with said potential of said image portion being regarded as the neutral polarity reference potential; and
second development means for developing a second latent electrostatic image with a second color toner, said second latent electrostatic image being formed on said latent electrostatic image carrier.

5,181,073
COPYING APPARATUS

Kazuhiro Araki, Okazaki, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 2, 1991, Ser. No. 724,715
Claims priority, application Japan, Jul. 3, 1990, 2-176935
Int. Cl.[5] G03G *15/04*
U.S. Cl. 355—243 **13 Claims**

1. A copying apparatus, comprising:
image forming means for forming an image of an original placed on a predetermined position on a sheet of copy paper;
detecting means for detecting a size of the original to be copied in a predetermined timing before a copying operation is performed;
copying condition determining means for determining copying conditions based on the size of the original detected by the detecting means;
indication means for indicating conditions corresponding to the copying conditions determined by the copying condition determining means;
action changeover means for changing over an action of said image forming means based on the copying conditions determined by the copying condition determining means;
copy starting means for outputting a copying action start signal to said image forming means; and

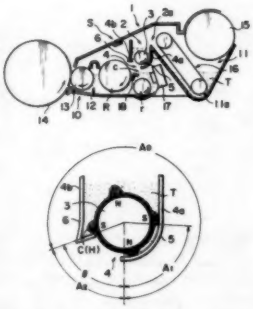


control means for commanding indication of the indication means in a timing corresponding to the detection by the detecting means, and also for commanding changeover of the action changeover means in a timing corresponding to the start signal of the copy starting means.

5,181,074
TONER REPLENISHING DEVICE

Mitsugu Nemoto; Noboru Koizumi, and Shigeru Okazaki, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 465,469, Jan. 16, 1990, abandoned. This application Mar. 15, 1991, Ser. No. 671,173
Claims priority, application Japan, Jan. 20, 1989, 1-11095; Jan. 20, 1989, 1-11096; Jan. 20, 1989, 1-11100
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—245 **20 Claims**



1. A device for feeding a developer to a developing apparatus, said developer comprising toner particles and carrier particles, said device comprising
a replenishing room for receiving said toner particles and said carrier particles,
an agitation chamber below said replenishing room and adjacent thereto, said chamber being adapted to receive said toner particles and said carrier particles from said replenishing room,
an agitator in said chamber to mix said toner particles and said carrier particles to produce said developer and to convey said developer to a developing device,
an opening between said replenishing room and said chamber through which said toner particles and said carrier

particles drop into said chamber, said opening having a first edge and a second edge,

a feed roller, adjacent to and disposed above said opening, for feeding said toner particles and said carrier particles through said opening, said feed roller including a plurality of magnets therein whereby said carrier particles are attracted to form a magnetic brush, said feed roller being rotatable in a direction such that a point on its periphery passes said first edge and then said second edge, whereby rotation of said feed roller permits said toner particles and said carrier particles to fall through said opening into said chamber,

a preventing member surrounding a part of a lower portion of said feed roller, said preventing member being separated from said feed roller by a first clearance having a height less than or equal to that of said magnetic brush, said first clearance being sealed by said magnetic brush when said roller is not rotated whereby said carrier particles are prevented from dropping through a gap between said roller and said preventing member and permitting said toner particles and said carrier particles to drop through said opening as said roller is rotated, and

a regulator adjacent said second edge and spaced therefrom by a second clearance, said regulator regulating the height of said magnetic brush.

5,181,075

DEVELOPMENT APPARATUS HAVING AN EXTENDED DEVELOPMENT NIP

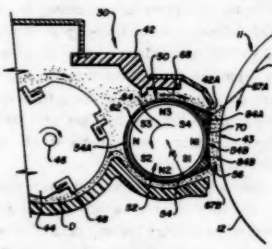
Bruce J. Rubin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 24, 1991, Ser. No. 719,904

The portion of the term of this patent subsequent to Jan. 14, 2009, has been disclaimed.

Int. Cl.[5] G03G *15/09*

U.S. Cl. 355—259 **10 Claims**



1. A development apparatus for developing latent images on an image-bearing surface using magnetic developer material, the development apparatus including;

(a) a housing;

(b) a magnetic development brush having a magnetic core, and a non-magnetic shell for forming a development nip with the image-bearing surface, said magnetic core generating a first magnetic field having a first magnetic strength region adjacent the core, said non-magnetic shell having a first portion located within said first magnetic strength region of said first magnetic field, and a second portion including an extended shoulder section associated with at least one side of said development nip for increasing the width of said development nip, said shoulder section extending said one side of said development nip into a second region beyond said first magnetic strength region of said first magnetic field; and

(c) a magnetizable material mounted between said non-magnetic shell and said magnetic core so as to lie partially within said first magnetic strength region of said first magnetic field, and partially within said shoulder section, said magnetizable material due to said first magnetic field forming a field magnet, and generating an auxiliary magnetic field at and about said extended shoulder section for enhancing and increasing the strength of a resultant magnetic field at and about said shoulder section, thereby enabling the forming of a magnetic developer material nap having a desired consistency and thickness at and about said shoulder section.

5,181,076

JAM PREVENTION MECHANISM

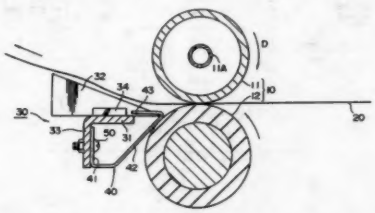
Tomoyuki Nishikawa, Matsudo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1991, Ser. No. 664,673

Claims priority, application Japan, Mar. 6, 1990, 2-54163

Int. Cl.[5] G03G *15/70*

U.S. Cl. 355—315 **13 Claims**



1. A jam prevention mechanism, adapted to be positioned in a device including a pair of rollers through which a sheet is to be fed, for preventing the sheet from being caught around one said pair of rollers, said jam prevention mechanism comprising:

at least one contact member arranged to be located at the downstream side of said pair of rollers along a sheet feeding direction, in contact with a circumferential surface of one of said pair of roller with a predetermined force, said contact member being elastically deformable in such a fashion that it is movable along the sheet feeding direction; and

stopper means, provided independently of said contact member, for restricting the movement of said contact member along the sheet-feeding direction elastically deformable extent of the said contact member.

5,181,077

ATOMIC ABSORPTION SPECTROMETER

Carl G. Deneks, and Gunther Roedel, both of Owingen, Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer GmbH, Uberlingen, Fed. Rep. of Germany

PCT No. PCT/EP89/00260, § 371 Date Oct. 10, 1990, § 102(e) Date Oct. 10, 1990, PCT Pub. No. WO89/08832, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 13, 1989, Ser. No. 549,013

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1988, 3809213

Int. Cl.[5] G01J *3/10*; G01N *21/31, 21/74*

U.S. Cl. 356—307 **1 Claim**

1. Atomic absorption spectrometer comprising

(a) a line emitting first light source (16),

(b) an optical system (20, 22, 28, 30, 34) for generating a measuring light beam from said first light source which passes through a sample cavity in a predetermined direction for impinging on a photoelectric detector (38),

(c) an atomizing device (14) arranged in the sample cavity for atomizing a sample such that the sample constituents are present in the atomic state in an atomizing area passed through by the measuring light beam,

(d) a continuum emitting second light source (70) from which a light beam (72) originates for background correction,

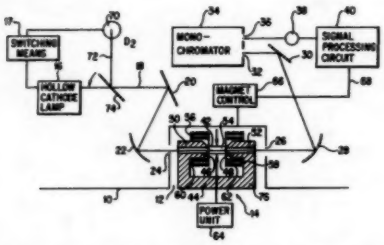
(e) a beam splitter (74) for reflecting, through the atomizing

area and as a reference beam, the light beam originating from the second light source (70),

(f) switching means for alternatingly switching on the two light sources (16, 70),

(g) a Zeeman arrangement for background correction including an solenoid,

(h) the solenoid being associated with the atomizing device for producing, in the atomizing area, a magnetic field extending substantially parallel to the predetermined direction of the measuring light beam and displacing the absorption lines of the sample atoms relative to the lines emitted by the first light source, due to the longitudinal Zeeman effect,



(i) magnet control means for switching on and off the solenoid,

(j) said beam splitter being movable into a moved-in operative position, in which the reference beam is directed through the atomizing area, and a moved-out inoperative position, and

(k) the beam splitter and the solenoid constituting parts of alternative background correction means having selectively placed either (i) the beam splitter into the moved-in operative position and the solenoid into a switched-off deenergized condition or (ii) the beam splitter into the moved-out inoperative position and the solenoid into a switched-on energized condition.

5,181,078

FIBER OPTIC MEASURING DEVICE, RATE GYRO, NAVIGATION AND STABILIZATION SYSTEM, AND CURRENT SENSOR

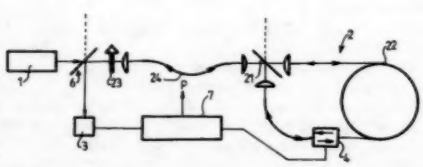
Hervé Lefevre, Paris, and Philippe Martin, Fresnes, both of France, assignors to Photonetics S.A., France

Filed Apr. 16, 1991, Ser. No. 685,682

Claims priority, application France, Apr. 17, 1990, 90 04908

Int. Cl.[5] G01C *19/72*

U.S. Cl. 356—350 **10 Claims**



1. A fiber optic measuring device in which variation in a measured parameter engenders a phase difference between two waves, the device comprising:

a) a quasi-monochromatic light source;

b) a preferably monomode SAGNAC ring interferometer in which two counter-propagating waves propagate, the propagation time of the waves between their splitting and their recombining being τ;

c) a detector;

d) a phase modulator; and

e) electronic means comprising a processing system furnishing a signal which is a function of the measured parameter, the electronic means controlling the phase modulator, wherein:

the control signal for the modulator is the superposition of (a) a first, periodic gating, bias signal $\Phi_b(t)$ with period 2τ and amplitude Φ_{bm}, and (b) a second, staircase, negative-feedback signal $\Phi_m(t)$ synchronized with $\Phi_b(t)$, each step of which has a duration equal to τ or to one of its sub-multiples, and an amplitude Φ_s, which is a function of the value of the measured parameter and which falls back to zero when its amplitude exceeds a predetermined value Φ_{mm};

Φ_{bm} and Φ_{mm} are slaved to $2\Phi_{bm}+\Phi_{mm}=2n\pi$ (where n is an integer);

the response to the singular phase shift introduced during the fall-back of the negative-feedback signal is for this slaving and hence used to keep the gain of the modulation chain constant; and

the electronic means negative-feedback controls the phase modulator as a function of the signal received from the detector so that (a) the variation in the demodulated error signal as a function of the phase difference in the neighborhood of zero is approximately linear, and (b) this phase difference is kept null and furnishing, by exploiting the modulating signal, a signal which is a function of the variation in the measured parameter;

said electronic means further comprising:

a clock synchronizing all the components of the electronic means;

an analog-digital converter for digitizing the signal emitted by the detector, the analog-digital converter being specified so that the analog value of its least significant bit has a value less than or equal to the standard deviation of the noise in the signal coming from the detector;

a servo-loop digital filter, fed by the signal leaving a digital processing system, furnishing a signal representing the measured parameter;

a register receiving the signal leaving the servo-loop digital filter and furnishing a signal which is a function of the measured parameter for any desired external use;

an accumulator fed by the signal leaving the register, generating a negative-feedback signal from the measured parameter, $\Phi_m(t)$;

a modulation generator producing a modulating signal $\Phi_b(t)$;

an adder comprising two inputs and one output, its first input being fed by the signal which is a function of the measured parameter produced by the register and the accumulator, its second input being fed by the modulating signal;

a digital-analog converter fed by the output signal from the adder and controlling the phase modulator via a gain amplifier;

a processing system which produces the difference between the signal sampled by the converter before the fall-back and that sampled after;

a second servo-loop integrating filter receiving the signal issuing from the processing system; and

a second analog-digital converter which controls the gain of the amplifier.

5,181,079

OPTOELECTRONIC MEASUREMENT ARRANGEMENT

Dietmar Klinger, Happurger Strasse 4, 8500 Nürnberg 30, Fed. Rep. of Germany

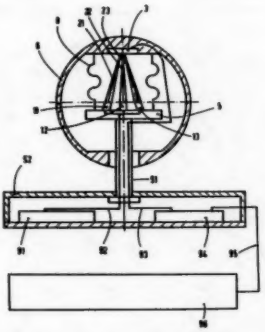
PCT No. PCT/EP89/00947, § 371 Date Jan. 28, 1991, § 102(e) Date Jan. 28, 1991, PCT Pub. No. WO90/02313, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 11, 1989, Ser. No. 646,600

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, 3827719

Int. Cl.[5] G01B *11/14, 11/03;* G01C *3/08*

U.S. Cl. 356—375 7 Claims



1. Optoelectronic measurement means for determining the position of two bodies relative to each other, comprising a first body, at least three light emitters arranged on the first body at the corner points of a notional polygon and operable to emit light beams, wherein the light beam axes of the light emitters represent, in pairs, different direction vectors, a control unit comprising electronic transmitting means to modulate the light emitters on-off in rotating sequence so that the emitters emit light pulses not overlapping in their time length, a second body, a position-sensitive two-dimensionally measuring light receiver arranged at the second body to receive the light beams and operable to generate, in dependence on the position of the points of incidence of the beams on the receiver and the beam axes, signal pairs representing at least one of relative translation and relative rotation of the two bodies, and means to determine the relative position of the two bodies from the signal pairs.

5,181,080

METHOD AND APPARATUS FOR EVALUATING THE THICKNESS OF THIN FILMS

Jeffrey T. Fanton, Los Altos; Jon Opsal, Livermore, and Allan Rosencwaig, Danville, all of Calif., assignors to Therma-Wave, Inc., Fremont, Calif.

Filed Dec. 23, 1991, Ser. No. 813,900

Int. Cl.[5] G01B *11/06*

U.S. Cl. 356—381 34 Claims

1. An apparatus for evaluating a parameter of a thin film on the surface of a sample comprising:

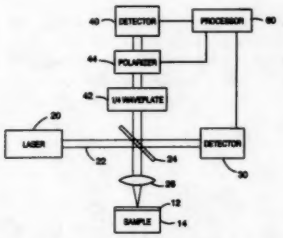
means for generating a probe beam of radiation;

means for focusing the probe beam substantially normal to the surface of the sample such that various rays within the focused probe beam create a spread of angles of incidence;

means for retarding the phase of one polarization state in the probe beam with respect to the phase of the other polarization state in the probe beam;

polarizing means for creating interference between the two polarization states in the probe beam after the probe beam has been reflected from the surface of the sample;

detector means for measuring the power of the reflected probe beam along two orthogonal axes after it has passed through the retarding and polarizing means, said detector means generating an output that integrates the intensity of various rays having different angles of incidence, said output having two components corresponding to said two orthogonal axes; and



processor means for evaluating a parameter of the thin film on the sample based on the output of the detector means.

5,181,081

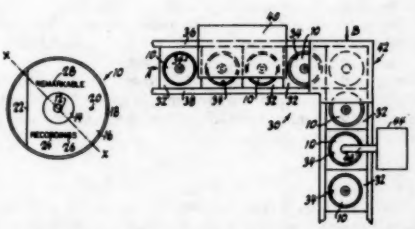
PRINT SCANNER

John M. Suhan, Blakely, Pa., assignor to WEA Manufacturing, Inc., Olyphant, Pa.

Filed Sep. 6, 1990, Ser. No. 579,080

Int. Cl.[5] G01B *11/00*

U.S. Cl. 356—394 18 Claims



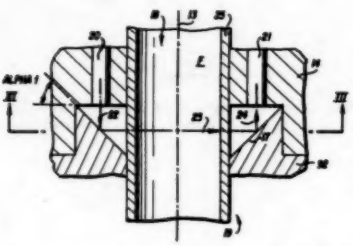
5. A method of examining printed labels of opaque compact discs having reflective surfaces, which discs have been moved through a printing station by a conveyor including the steps of providing a camera station at a predetermined position along said conveyor, exposing an acceptable reference label to a scanning video camera at said camera station to acquire an image made up of a plurality of pixels of said reference label, storing said reference label image, stationarily positioning a plurality of successive discs to be tested within said camera station, exposing a disc stationarily positioned in said camera station to light to acquire a test image made up of a multiplicity of pixels of the label of said disc and subtracting one of said images pixel-by-pixel from the other image to obtain a measure of the acceptability of a label being tested, said test image acquiring step comprising averaging a plurality of test label images.

5,181,082

ON-LINE TITRATION USING COLORIMETRIC END POINT DETECTION

Anthony C. Jeannotte; Anthony C. Gilby, both of Foxboro; M. Charles Cheney, Wrentham, and Barry J. Meneghelli, Plymouth, all of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Continuation-in-part of Ser. No. 330,533, Mar. 30, 1989, Pat. No. 5,007,740. This application Apr. 24, 1990, Ser. No. 514,061
The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.
Int. Cl.[5] G01N *21/00, 1/10*
U.S. Cl. 356—436 41 Claims



1. In apparatus for titration of a fluid, colorimetric endpoint detection apparatus comprising:

a) means for directing radiant energy from a source into and through a chamber to an exit;

b) first pathway means for conveying radiant energy to said means for directing radiant energy through said chamber;

c) means for collecting said radiant energy exiting from said chamber;

d) second pathway means for conveying radiant energy away from said chamber exit to a detector;

e) means for generating a modulated first optical signal on said first pathway means;

f) means for generating a modulated second optical signal on said first pathway means;

g) means for detecting a colorimetric optical signal on said second pathway means;

h) means for demodulating said first optical signal;

i) means for demodulating said second optical signal; and

j) means for relating the first and second demodulated optical signals to a colorimetric endpoint,

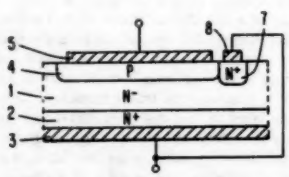
wherein said means for directing radiant energy into and through said chamber to said exit and said means for collecting radiant energy comprise partial surfaces of at least one interior conical reflecting surface.

5,181,083

PIN DIODE WITH A LOW PEAK-ON EFFECT

Robert Pezzani, Vouvray, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Jul. 15, 1991, Ser. No. 730,167
Claims priority, application France, Jul. 16, 1990, 90 09342
Int. Cl.[5] H01L *29/90, 29/74*
U.S. Cl. 257—491 6 Claims



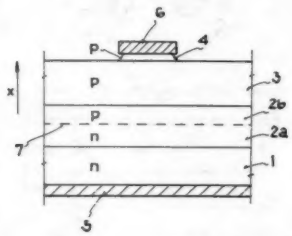
1. A PIN diode with protection against transient overvoltages comprising a P-type anode region formed above a low doped N-type substrate; a cathode region formed below the substrate; and an additional N^+-type region forming a junction with the anode region; said additional region being connected to the cathode region through a path outside semiconductor regions of said diode of said substrate.

5,181,084

INFRARED LIGHT EMITTING DIODE WITH GRADING

Ulrich Bommer, Eppingen-Rohrbach, and Werner Schairer, Weinsberg, both of Fed. Rep. of Germany, assignors to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Sep. 5, 1991, Ser. No. 755,096
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1990, 4031290
Int. Cl.[5] H01L *33/00*
U.S. Cl. 257—94 19 Claims



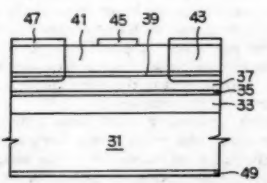
1. A semiconductor arrangement for a light emitting diode comprising: an epitaxial semiconductor layer sequence on a semiconductor substrate made of monocrystalline GaAs of n-conductivity type, and wherein said sequence includes a first silicon-doped epitaxial GaAlAs layer provided on said semiconductor substrate and having an aluminum concentration of 1.5 to 80% at its barrier surface with said semiconductor substrate and decreasing over its layer thickness, said first layer having a first zone of n-conductivity type at said barrier surface with said substrate and a second zone of p-conductivity type forming a pn-junction with said first zone, and a second epitaxial GaAlAs layer of p-conductivity type provided on said first epitaxial GaAlAs layer, and having an aluminum concentration at its barrier surface with said first epitaxial GaAlAs layer of 10–80% and which decreases over the thickness of said second layer.

5,181,085

COMPOUND SEMICONDUCTOR DEVICE WITH BIPOLAR TRANSISTOR AND LASER DIODE

Seung H. Moon, and Yung S. Yoon, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suweon, Japan

Filed Oct. 22, 1991, Ser. No. 780,466
Claims priority, application Rep. of Korea, Apr. 3, 1991, 91-5361
Int. Cl.[5] H01L *33/00*
U.S. Cl. 257—94 7 Claims



1. A compound semiconductor device which incorporates a

laser diode and a heterojunction bipolar transistor in the same chip, the device comprising:

a laser diode comprising:

a first conductive type compound semiconductor substrate,

a first compound semiconductor layer of a first conductive type formed on said compound semiconductor substrate as a lower cladding layer,

a second compound semiconductor layer formed on said first compound semiconductor layer for emitting light,

a third compound semiconductor layer of a second conductive type formed on said second compound semiconductor layer as an upper cladding layer, and

a third electrode formed on said semiconductor substrate; and

a heterojunction bipolar transistor comprising:

a fourth compound semiconductor layer of the first conductive type formed on said third compound semiconductor layer as a base region,

a fifth compound semiconductor layer of the second conductive type formed on said fourth compound semiconductor layer as an emitter region,

a first electrode of the second conductive type formed on a predetermined part of said fifth compound semiconductor layer,

a second electrode of the first conductive type formed on both sides of said first electrode on said fifth compound semiconductor layer,

a first conductive type impurity region under said second electrode and overlapping said third compound semiconductor layer to a predetermined depth for connecting said third compound semiconductor layer to said fourth compound semiconductor layer electrically, and

a third compound semiconductor layer serving as a collector region, which is used in common with said laser diode.

5,181,086

STRAINED SUPERLATTICE SEMICONDUCTOR STRUCTURE

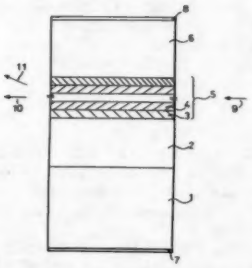
Naohito Yoshida, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1991, Ser. No. 698,150

Claims priority, application Japan, May 17, 1990, 2-130018

Int. Cl.[5] H01L *33/00*

U.S. Cl. 257—18 **9 Claims**



1. A semiconductor structure for a light-interactive semiconductor device comprising:

first and second crystalline InP cladding layers having a first lattice constant; and

a strained superlattice structure disposed in contact with and between the first and second InP cladding layers and comprising alternating crystalline $In_xGa_{1-x}As$ quantum barrier layers having a first energy band gap and a second lattice constant and crystalline $In_yGa_{1-y}Ga$ quantum well layers having a second energy band gap less than the first energy band gap and a third lattice constant wherein the first lattice constant is approximately equal to the average of the second and third lattice constants and the second lattice constant differs from the third lattice constant by at least about 0.5 percent of the second lattice constant.

5,181,087

SEMICONDUCTOR DEVICE AND METHOD OF PRODUCING THE SAME

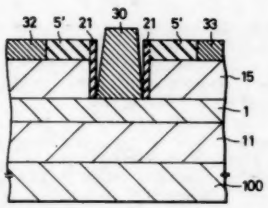
Toshiyuki Usagawa, Koganei; Yoshinori Imamura, Kanagawa; Hidekazu Okuhira, Hachiouji; Shigeo Goto, Kokubunji; Masayoshi Kobayashi, Hachiouji, and Shinichiro Takatani, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 17,551, Feb. 24, 1987, abandoned. This application Apr. 19, 1989, Ser. No. 340,471

Claims priority, application Japan, Feb. 28, 1986, 61-41768; Mar. 14, 1986, 61-54624

Int. Cl.[5] H01L *29/80, 29/48, 29/06, 23/48*

U.S. Cl. 257—194 **52 Claims**



1. A semiconductor device constituting a 2-dimensional carrier gas-FET comprising:

a semi-insulating GaAs substrate;

an undoped GaAs layer;

an undoped $Al_xGa_{1-x}As$ layer;

a doped $Al_yGa_{1-y}As$ layer; and

another undoped $Al_zGa_{1-z}As$ layer having a thickness of 50–200 Å, said layers being positionally disposed in a vertical arrangement on said substrate in the order given above, the values of x, y and z ranging from 0.3 to 0.4, from 0.2 to 0.4 and from 0.3 to 0.4, respectively, and further comprising:

a cap layer of high dopant impurity concentration disposed on said another undoped $Al_ZGa_{1-z}As$ layer and having a recess for forming therethrough a gate electrode;

said gate electrode being disposed inside said recess and on said another undoped $Al_zGa_{1-z}As$ layer and being isolated from said cap layer through an inorganic side wall insulator film disposed only on the side wall inside said recess in said cap layer;

a source electrode disposed on said cap layer; and

a drain electrode disposed on said cap layer.

5,181,088

VERTICAL FIELD EFFECT TRANSISTOR WITH AN EXTENDED POLYSILICON CHANNEL REGION

Yuuichi Mikata, Kawasaki, and Toshiro Usami, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 406,910, Sep. 14, 1989, abandoned. This application May 8, 1991, Ser. No. 700,311

Claims priority, application Japan, Sep. 14, 1988, 63-231058

Int. Cl.[5] H01L *29/10*

U.S. Cl. 257—331 **4 Claims**

4. A semiconductor device having an MOS transistor struture, comprising:

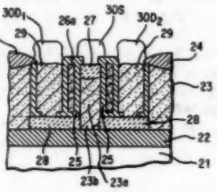
a projection formed of a polysilicon layer having grain boundaries, said projection being over a main horizontal plane of a substrate, and said projection having first and second vertical side walls;

a first gate electrode which faces one of the first vertical side wall of said projection, so that a conductive channel forming area is formed in said projection;

a first gate insulating film interposed between said first gate and said projection;

a second gate electrode which faces the second vertical side wall of said projection, so that a conductive channel forming area is formed in said projection;

a second gate insulating film interposed between said second gate and said projection;



a first region of a first conductivity type having a vertical side wall, said first region being on the main horizontal plane of said substrate with the vertical side wall of the first region coincident with a portion of the first vertical side wall of said projection; and

a second region of the first conductivity type having a vertical side wall, the second region being on the main horizontal plane of said substrate with the vertical side wall of the second region coincident with a portion of the second vertical side wall of said projection.

5,181,089

SEMICONDUCTOR MEMORY DEVICE AND A METHOD FOR PRODUCING THE SAME

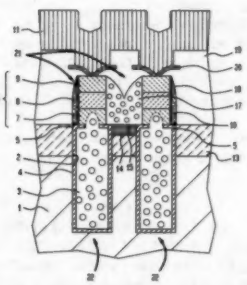
Naoto Matsuo, Ibaraki; Shozo Okada, Kobe, and Michihiro Inoue, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 565,049, Aug. 9, 1990, abandoned. This application Jul. 17, 1991, Ser. No. 731,420

Claims priority, application Japan, Aug. 15, 1989, 1-209646

Int. Cl.[5] H01L *29/68, 29/10, 29/06*

U.S. Cl. 257—299 **2 Claims**



1. A semiconductor memory device comprising a semiconductor substrate of a first conductivity type, a plurality of trench capacitors formed in said substrate and a plurality of switching transistors formed on the respective trench capacitors, each of said switching transistors being electrically connected to the corresponding trench capacitor, wherein said trench capacitor has a first electrode formed in the side portion of a trench provided in said substrate and a second electrode containing impurities of the first conductivity type and embedded in said trench, and wherein said switching transistor has a source region formed from a first epitaxial layer of the first conductivity type grown on said trench so as to electrically contact said second electrode, a channel region formed from a second epitaxial layer of a second conductivity type grown on said first epitaxial layer, and a drain region formed from a third epitaxial layer of the first conductivity type grown on said second epitaxial layer; said first, second and third epitaxial layers being in contact with a polycrystalline silicon layer containing impurities of the second conductivity type; said first conductivity type being opposite to said second conductivity type.

5,181,090

HIGH VOLTAGE CMOS DEVICES

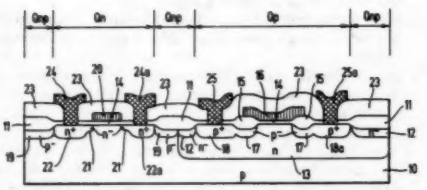
Yutaka Maruo, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,202

Claims priority, application Japan, May 25, 1988, 63-125634

Int. Cl.[5] H01L *27/92*

U.S. Cl. 257—344 **9 Claims**



1. In a semiconductor device comprising a substrate having a memory cell region and a peripheral circuit region, the memory cell region being composed of a plurality of memory transistors each defined by a first high breakdown voltage transistor of a first conductivity type and a plurality of select transistors each defined by a second high breakdown voltage transistor of the first conductivity type, and the peripheral circuit region having a part which is constituted by a third high breakdown voltage transistor of a second conductivity type, the improvement wherein: said first and second high breakdown voltage transistors each include a first gate electrode having an end, and a first offset region defined by a low concentration impurity region having a substantially flat surface which is formed in a region of said substrate which is below and adjacent to said end of said first gate electrode; and said third high breakdown voltage transistor has a second gate electrode, a thick insulating film provided at one side of said second gate electrode, with at least a part of said film being buried in said substrate, and a second offset region defined by a low concentration impurity region provided in a region of said substrate which is under said thick insulating film.

5,181,091

INTEGRATED CIRCUIT WITH IMPROVED PROTECTION AGAINST NEGATIVE TRANSIENTS

Thomas E. Harrington, III, Carrollton, and Robert D. Lee, Denton, both of Tex., assignors to Dallas Semiconductor Corp., Dallas, Tex.

Continuation of Ser. No. 345,144, Apr. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 187,864, Apr. 29, 1988, Pat. No. 4,862,310. This application Sep. 16, 1991, Ser. No. 760,411

Int. Cl.[5] H01L *29/78*

U.S. Cl. 257—355 **19 Claims**

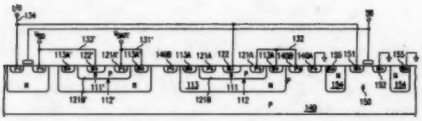
1. An output protection structure for CMOS integrated circuit, comprising:

at least one signal output terminal, said signal output terminal being connected to be driven by a driver field effect transistor formed in a semiconductor layer;

a first region in said layer having a first conductivity type, and connected to ground potential;

said first region abutting a second region having a second conductivity type which is opposite to said first conductivity type, said first and second regions defining a first junction therebetween;

said second region being connected to said signal terminal so that said first junction will be forward biased if said signal



output terminal is pulled negative by an externally applied voltage;

a second junction surrounding said first junction, said second junction being shorted out by an ohmic connection;

whereby minority carriers which are injected in the vicinity of said first junction will be collected at said second junction.

5,181,092

INPUT PROTECTION RESISTOR USED IN INPUT PROTECTION CIRCUIT

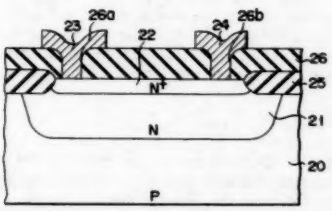
Shigeru Atsumi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 21, 1991, Ser. No. 672,933

Claims priority, application Japan, Mar. 22, 1990, 2-69722

Int. Cl.[5] H01L *29/78*

U.S. Cl. 257—361 **19 Claims**



15. An input protection circuit for protecting a protected circuit from voltage surges in a signal at an input pad, said input protection circuit comprising:

an input protection resistor comprising a first region of a second conductivity type in a semiconductor body of a first conductivity type and a second region of the second conductivity type surrounded by said first region, said second region having an impurity concentration higher than an impurity concentration of said first region;

a first wiring layer coupling said input pad and said second region;

a second wiring layer coupled to said second region at a position spaced from said first wiring layer and coupling said second region to an input stage of said protected circuit; and

an input protection element coupled between said second wiring layer and one of a ground terminal and a power source.

5,181,093

SOLID STATE IMAGE SENSOR HAVING HIGH CHARGE TRANSFER EFFICIENCY

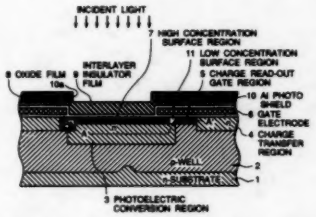
Hisao Kawaura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 26, 1991, Ser. No. 798,136

Claims priority, application Japan, Nov. 26, 1990, 2-321913

Int. Cl.[5] H01L *29/78;* **G11C** *19/28*

U.S. Cl. 257—223 **2 Claims**



1. A solid state image sensor comprising a semiconductor region of a first conduction type, a photoelectric conversion region of a second conduction type formed in a surface region of said semiconductor region, a charge transfer region of the second conduction type formed in the surface region of said semiconductor region and separated from said photoelectric conversion region, an electric charge read-out gate region formed between said photoelectric conversion region and said charge transfer region, a thin surface layer region of the first conduction type having a high impurity concentration and formed to cover a surface of said photoelectric conversion region excluding an end portion adjacent to said electric charge read-out gate region, and a gate electrode formed above said electric charge read-out gate region and extending to partially overlap said photoelectric conversion region, said gate electrode being electrically isolated from said electric charge read-out gate region and said photoelectric conversion region, said end portion of said photoelectric conversion region which is adjacent to said electric charge read-out gate region and which is not covered by said high concentration thin surface layer region, having a short length sufficient to make a potential well formed in said end portion shallow under influence of potentials of said high concentration thin surface layer region and said electric charge read-out gate region;

wherein said end portion of said photoelectric conversion region which is adjacent to said electric charge read-out gate region and which is not covered by said high concentration thin surface layer region, is formed of a low impurity concentration surface region; and

wherein said low impurity concentration surface region is doped with impurities of the first conduction type of the amount sufficient to substantially cancel the impurity concentration of the second conduction type of said photoelectric conversion region.

5,181,094

COMPLEMENTARY SEMICONDUCTOR DEVICE HAVING IMPROVED DEVICE ISOLATING REGION

Takahisa Eimori; Wataru Wakamiya; Hiroji Ozaki; Yoshinori Tanaka, and Shinichi Satoh, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 409,379, Sep. 19, 1989, abandoned. This application Oct. 25, 1991, Ser. No. 783,029

Claims priority, application Japan, Sep. 29, 1988, 63-247673

Int. Cl.[5] H01L *29/78, 23/48, 27/08*

U.S. Cl. 257—372 **25 Claims**

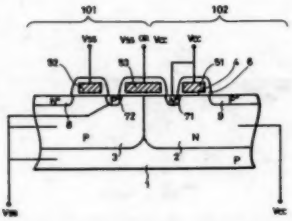
1. A complementary semiconductor device comprising a first region of a first conductivity type formed on a main surface of a substrate of said first conductivity type and a second region of a second conductivity type different from said first

conductivity type formed adjacent said first region, said complementary semiconductor device comprising:

a third region of the second conductivity type formed in said first region;

a fourth region of the first conductivity type formed in said second region;

first field shield means formed on said first region for preventing conduction between said second region and said third region;



second field shield means formed on said second region for preventing conduction between said first region and said fourth region; and

a fifth, electrically conductive, region formed at the junction between said first region and said second region on the main surface of said substrate and maintained at a fixed potential.

5,181,095

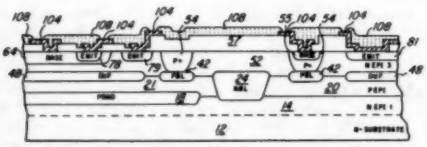
COMPLEMENTARY BIPOLAR AND MOS TRANSISTOR HAVING POWER AND LOGIC STRUCTURES ON THE SAME INTEGRATED CIRCUIT SUBSTRATE

Dan M. Mosher, Plano; Larry Latham, Garland; Bob Todd, Plano; Cornelia H. Blanton, Plano; Joe R. Trogolo, Plano, and David R. Cotton, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 671,625, Mar. 19, 1991, which is a continuation of Ser. No. 561,490, Aug. 1, 1990, abandoned, which is a continuation of Ser. No. 309,515, Feb. 10, 1989, abandoned. This application Apr. 19, 1991, Ser. No. 688,196

Int. Cl.[5] H01L *27/02, 27/04, 29/10*

U.S. Cl. 257—370 **5 Claims**



1. An integrated circuit device comprising:

a N-type semiconductor substrate;

a first N-type epitaxial layer disposed over said semiconductor substrate;

a second P-type epitaxial layer disposed over said first epitaxial layer;

a third N-type epitaxial layer disposed over said second epitaxial layer, said third epitaxial layer having first, second, and third tank regions for formation of a bipolar transistor, a N-channel MOSFET and a P-channel MOSFET;

first and second P-type isolation regions for isolating said first epitaxial tank from said second and third tank regions;

a first P-type buried ground region and extending through the first and second epitaxial layers disposed between said semiconductor substrate and said third epitaxial layer of said first tank region;

first, second, third and fourth P-type diffusion regions formed in said first tank region, said first and second P-type diffusions being disposed in said first set of isolation regions for providing respective first and second collector regions for said bipolar transistor, said third and fourth diffusions being disposed in said epitaxial layer for providing emitter regions for said bipolar transistor;

a fifth P-type diffusion disposed in said second tank region for providing a P-well for said N-channel MOSFET;

sixth and seventh P-type diffusions disposed in said third tank region for providing source and drain regions for said P-channel MOSFET;

a first N-type diffusion region formed in said first tank region between said third and fourth P-type diffusions for providing a base region for said bipolar transistor;

second and third N-type diffusions formed in said second tank region for providing source and drain regions for said N-channel MOSFET.

5,181,096

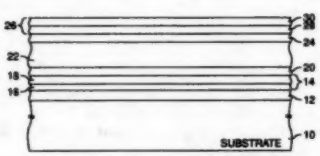
ELECTRICALLY PROGRAMMABLE ANTIFUSE INCORPORATING DIELECTRIC AND AMORPHOUS SILICON INTERLAYER

Abdul R. Forouhi, San Jose, Calif., assignor to Actel Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 508,306, Apr. 12, 1990, Pat. No. 5,070,384. This application Oct. 26, 1990, Ser. No. 604,779

Int. Cl.[5] H01L *23/48, 29/46, 27/02, 29/62*

U.S. Cl. 257—530 **48 Claims**



1. An electrically programmable antifuse element disposed over an insulating layer covering active elements disposed in a semiconductor substrate in an integrated circuit, said antifuse comprising:

a first electrode disposed over said insulating layer;

a first dielectric layer disposed over said first electrode;

an antifuse layer disposed over said first dielectric layer;

a second dielectric layer disposed over said antifuse layer;

a second electrode disposed over said second dielectric layer.

5,181,097

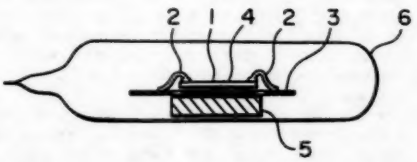
PLASTIC MOLDED TYPE ELECTRONIC DEVICE

Masatsugu Ogata; Yasuhide Sugawara; Masanori Segawa, all of Hitachi; Hidetoshi Abe, Katsuta, and Osamu Horie, Shimodate, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 364,459, Jun. 12, 1989, abandoned. This application Nov. 13, 1990, Ser. No. 611,549

Int. Cl.[5] H01L *23/28*

U.S. Cl. 257—788 **9 Claims**



1. A plastic molded type electronic device, wherein the device is sealed with a phenolic resin molding composition comprising a resin component consisting of a resol-type phenol resin and at least one epoxy resin in a weight ratio of from

75:25 to 95:5, the resin component having been purified until it gives, when extracted by heating with 10 times the amount of hot water at 120° C. for 100 hours or more, an extract having an electric conductivity of 100 μS/cm or less, a pH of 4–7 and a halogen ion content of 10 ppm or less.

5,181,098

PROCEDURE AND DEVICE FOR THE AUTOMATIC CORRECTION OF SKEW, OF COLOR SUPERIMPOSITION, AND OF IMAGE UNIFORMITY FOR TELEVISION CAMERAS

Jean-Claude Guerin, and Philippe Morel, both of Rennes, France, assignors to Thomson Comsumer Eletronics, Courbevoie, France

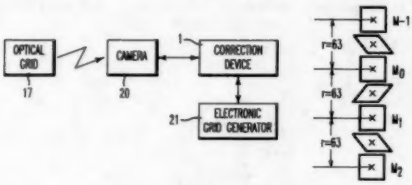
PCT No. PCT/FR91/00022, § 371 Date Oct. 22, 1991, § 102(e) Date Oct. 22, 1991, PCT Pub. No. WO91/11075, PCT Pub. Date Jul. 25, 1991

PCT Filed Jan. 14, 1991, Ser. No. 761,866

Claims priority, application France, Jan. 16, 1990, 90 00426

Int. Cl.[5] H04N *17/02, 9/093*

U.S. Cl. 358—10 **12 Claims**



1. Procedure for automatic correction of skew, of color superimposition, and of image uniformity for television cameras, by means of an optical grid placed in front of a camera and composed of predetermined homologous patterns whose centers of rotation are located, in accordance with a matrix structure, at points of intersection of evenly-spaced rows and columns, and by means of an electronic reference grid which is analogous to the optical grid, each homologous pattern of the optical and reference grids being scanned during line scanning by the camera using scanning means so as to furnish two video signals, the procedure comprising the steps of:

measuring position errors of the centers of rotation of patterns reconstructed by the camera in relation to their respective positions on the electronic reference grid;

computing a first series of correction values for eliminating the measured position errors of the centers of rotation of each pattern requiring correction;

computing, for each pattern requiring correction, a second series of correction values for points of the patterns located on vertical straight-line segments positioned adjacent opposed sides of the centers of rotation by means of a cubic interpolation computation which takes into account, for each pattern requiring correction, the measured position error of the pattern's center of rotation and the measured position errors of the centers of rotation of patterns of the optical grid which are in the pattern's column;

storing the first and second series of correction values; and

sending the stored first and second series correction values to the scanning means of the camera in synchronism with horizontal and vertical scanning operations of the camera to perform the correction.

5,181,099

COMPOSITE VIDEO SIGNAL GENERATOR

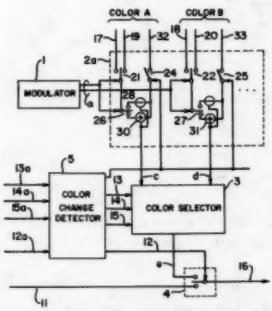
Takafumi Esaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 800,566

Claims priority, application Japan, Nov. 30, 1990, 2-338554

Int. Cl.[5] H04N *9/00*

U.S. Cl. 358—21 R **3 Claims**



1. A composite video signal generator comprising:

a color signal generating means for generating color signals of a pulse waveform each having predetermined high and low voltages in association with an individual color;

a color selecting means for selectively outputting the color signals output from the color signal generating means in accordance with an input character color signal; and

an output means for combining a composite video input signal with the color signal sent from the color selecting means in accordance with an input character data presence/absence signal to output a resultant signal as a composite video output signal;

said generator further comprising

a color change detecting means for detecting changes in the input character color signal and character data presence/absence signal to output a color change signal; and

a low amplitude color signal generating means, provided in the color signal generating means, for generating a color signal of a pulse waveform having a lower amplitude than an amplitude determined by the high and low level voltages in accordance with the color change signal output from the color change detecting means.

5,181,100

DIGITAL VIDEO PROCESSING SYSTEM WITH MIXING PREFILTER

David O. Hodgson, San Mateo, Calif., assignor to Sony Corporation of America, Park Ridge, N.J.

Filed Jul. 25, 1991, Ser. No. 736,006

Int. Cl.[5] H04N *7/12*

U.S. Cl. 358—37 **16 Claims**

1. A system for combining digital signals, including:

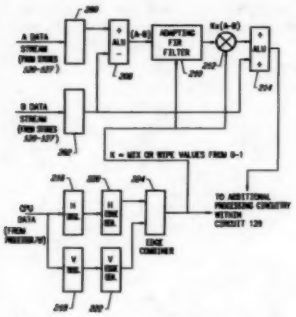
means for generating an input digital signal representing a digitized image;

an anti-aliasing filter for generating a filtered input digital signal from the input digital signal;

means for generating a second digital signal; and

a multiplication circuit for receiving the filtered input digital signal and the second digital signal, and multiplying the filtered input digital signal and the second digital signal to generate a third digital signal, wherein the anti-aliasing

filter generates the filtered input digital signal by removing high frequency components of the input digital signal



that would otherwise result in aliasing error during multiplication in the multiplication circuit.

5,181,101

IMAGE SENSING APPARATUS

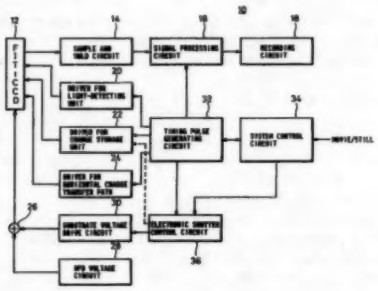
Kazuya Oda, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 21, 1992, Ser. No. 822,655

Claims priority, application Japan, Jan. 21, 1991, 3-005254

Int. Cl.[5] H04N *9/04*

U.S. Cl. 358—41 **7 Claims**



1. An image sensing apparatus at least comprising:

a charge-coupled device of a frame interline-transfer system;

a sample and hold circuit for sampling image information output from said charge-coupled device;

a signal processing circuit for subjecting a signal output from said sample and hold circuit to a predetermined process so as to output a luminance signal and a color difference signal therefrom;

a recording circuit for recording the luminance signal and the color difference signal output from said signal processing circuit on a recording medium;

a driver circuit for driving a light-detecting unit including first and second fields, of said charge-coupled device and for generating signals used to transfer electric charges stored in a plurality of vertical charge transfer paths formed in said light-detecting unit to a storage unit;

a driver circuit for driving said storage unit used to store therein the electric charges transferred from said vertical charge transfer paths and for generating signals used to transfer the electric charges to a horizontal charge transfer path;

a driver circuit for driving said horizontal charge transfer path, said driver circuit being used to generate signals for transferring the electric charges transferred to said horizontal charge transfer path to said sample and hold circuit;

a timing pulse generating circuit for supplying a synchronizing signal to each of said signal processing circuit, said driver circuit for driving the light-detecting unit, said driver circuit for driving said storage unit, and said driver circuit for driving said horizontal charge transfer path;

an electronic shutter control circuit for generating a control signal corresponding to the shutter speed therefrom;

a substrate voltage drive circuit for generating an electronic shutter pulse signal based on the control signal output from said electronic shutter control circuit;

an overflow drain voltage circuit for generating a direct current bias voltage used for the overflow drain; and

an adding circuit for adding the level of the electronic shutter pulse signal generated from said substrate voltage drive circuit and the level of the direct current bias voltage generated from said overflow drain voltage circuit.

5,181,102

TELEVISION CAMERA AND DISPLAY EMPLOYING QUINCUNCIAL SCANNING

Max Artigalas, Le Chesnay, France, assignor to Thomson Consumer Electronics, Courbevoie, France

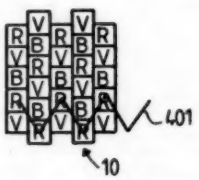
PCT No. PCT/FR90/00617, § 371 Date Apr. 5, 1991, § 102(e) Date Apr. 5, 1991, PCT Pub. No. WO91/03125, PCT Pub. Date Mar. 7, 1991

PCT Filed Aug. 17, 1990, Ser. No. 675,881

Claims priority, application France, Aug. 25, 1989, 89 11255

Int. Cl.[5] H04N *7/00*

U.S. Cl. 358—56 **16 Claims**



1. A high definition television receiver device comprising

a visual display having a plurality of quincumcially disposed display cells, a high definition video signal source **(40)**,

circuitry **(41, 42, 45** and **50)** connected between said source and display for generating a signal with a plurality of quincuncial lines (N) and operating in a subsampling mode,

an optical filter between said display and viewer for correcting diagonal resolution.

5,181,103

WHITE BALANCE ADJUSTING SYSTEM FOR A COLOR TELEVISION SYSTEM

Aoyama: Tatsuya, Tokyo, Japan, assignor to Pioneer Electronic Corp., Tokyo, Japan

Filed Dec. 20, 1991, Ser. No. 811,334

Claims priority, application Japan, Jun. 13, 1991, 3-168824

Int. Cl.[5] H04N *9/16, 9/18, 9/31, 5/74*

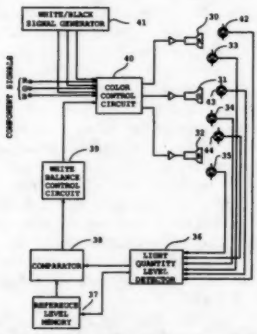
U.S. Cl. 358—64 **4 Claims**

1. A white balance adjusting system for a color television system having three projecting means for projecting beams of three primary colors, and a color control circuit for controlling outputs of the three projecting means, the adjusting system comprising:

light quantity detecting means provided adjacent to each of said projecting means for detecting a quantity of light output from each projecting means;

memory means for storing three reference quantities of respective color lights for obtaining a white balance;

comparing means for comparing each detected quantity of the color light with the reference quantity, thereby determining a difference therebetween;



control means for operating the color control circuit so as to reduce the difference determined by the comparing means to a predetermined value.

5,181,104

IMAGE PROCESSING APPARATUS HAVING A READER MOVABLE TO A DESIGNATED POSITION

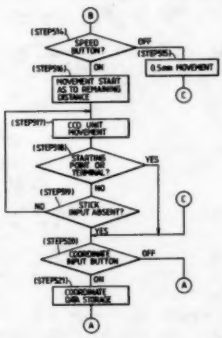
Kiyohisa Sugishima, Yokohama, and Masahiro Nishio, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 353,710, May 18, 1989, abandoned. This application Jul. 22, 1991, Ser. No. 733,976

Claims priority, application Japan, May 20, 1988, 63-123681; Oct. 11, 1988, 63-256328; Oct. 11, 1988, 63-256331

Int. Cl.[5] H04N *1/04*

U.S. Cl. 358—75 **26 Claims**



1. An image processing apparatus comprising:

reader means for reading an image and generating image data corresponding thereto;

first moving means for moving a reading position of said reader means in a main scanning direction;

second moving means for moving the reading position of said reader means in a sub-scanning direction;

setting means for setting a desired operation mode;

designating means for designating movement of the reading position of said reader means to a desired position; and

control means for controlling said first and second moving means to cause, if a first mode has been set by said setting means, the reading position of said reader means to be moved a plurality of times in the main scanning direction, and also to be moved in the sub-scanning direction every time the reading position is moved in the main scanning direction so that said reader means can read the image, and to cause, if a second mode has been set by said setting means, the reading position of said reader means to be moved to the desired position in accordance with the designation of said designating means so that said reader means can read the image at the desired position, said control means further controlling said first and second moving means, in the second mode, to cause said reader means to be moved at a plurality of moving speeds in accordance with the designation of said designating means.

5,181,105

COLOR IMAGE CORRECTION BASED ON CHARACTERISTICS OF A HIGHLIGHTS OR OTHER PREDETERMINED IMAGE PORTION

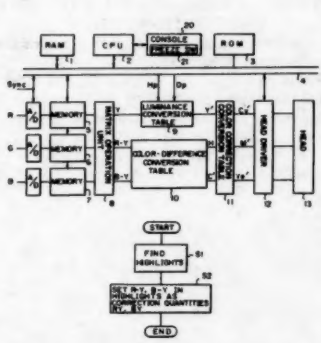
Yoshiro Udagawa, Tokyo, and Hideo Takiguchi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 560,295, Jul. 29, 1990, which is a continuation of Ser. No. 54,588, May 27, 1987. This application Aug. 2, 1991, Ser. No. 739,660

Claims priority, application Japan, May 30, 1986, 61-123716; May 30, 1986, 61-123717; May 30, 1986, 61-123718; May 30, 1986, 61-123719; May 30, 1986, 61-123720; May 30, 1986, 61-123721; May 30, 1986, 61-123722; May 30, 1986, 61-123723

Int. Cl.[5] H04N *9/74*; G03F *3/08*

U.S. Cl. 358—80 **25 Claims**



1. A color image processing apparatus comprising:

detecting means for detecting a pixel of a predetermined luminance from a color image signal consisting of a luminance signal and color difference signals;

correction amount operating means for calculating correction amounts to the color difference signals of each of pixels constituting an image from the color difference signals of the pixels of a predetermined luminance; and

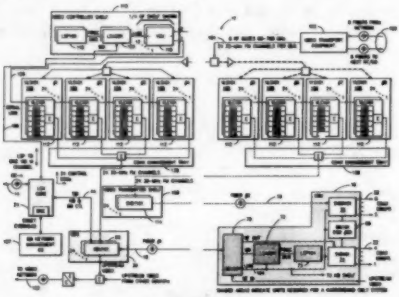
correcting means for correcting the color difference signals of each of the pixels constituting the image in accordance with said correction amounts.

5,181,106

VIDEO LINE SHELF ARRANGEMENT IN AN OPTICAL FIBER TELECOMMUNICATIONS NETWORK PROVIDING BROADBAND SWITCHED VIDEO SERVICES

Joseph E. Sutherland, Raleigh, N.C., assignor to Alcatel Network Systems, Inc., Richardson, Tex.

Filed Jul. 31, 1991, Ser. No. 738,332
Int. Cl.[5] H04N *7/22, 7/18*
U.S. Cl. 358—86 **6 Claims**



1. A video line shelf arrangement, comprising:

a plurality of video line shelves arranged vertically one above the other, each video line shelf including a plurality of slots, the slots of the video line shelves being arranged vertically over each other;

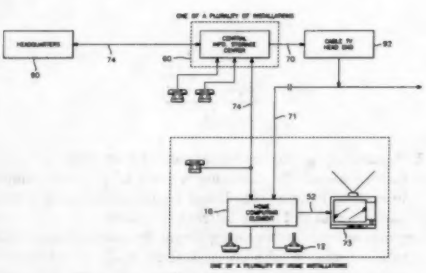
a plurality of video line cards disposed in slots within the video line shelves, the video line cards disposed in columns of vertically-arranged slots being adapted to service a single optical network unit, whereby only the required number of video line cards need be inserted in vertically-aligned slots to provide the required channels for each optical network unit.

5,181,107

TELEPHONE ACCESS INFORMATION SERVICE DISTRIBUTION SYSTEM

Donald E. Rhoades, Miami, Fla., assignor to Interactive Television Systems, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 423,946, Oct. 19, 1989, Pat. No. 5,051,822. This application Sep. 20, 1991, Ser. No. 763,301
The portion of the term of this patent subsequent to Sep. 24, 2008, has been disclaimed.
Int. Cl.[5] H04H *1/02*
U.S. Cl. 358—86 **20 Claims**



1. A bi-directional, interactive communications system for transmitting in a digital format, information services to a plurality of subscriber locations on demand, said bi-directional communications system comprising:

a remote information services storage center for storing a variety of information service programs,

a television broadcast facility for uni-directionally transmitting a selected one of said variety of information service programs,

a home computing assembly disposed at each subscriber location and connected bi-directionally by telephone lines to the remote information services storage center and also being linked to the television broadcast facility,

a television receiver connected to said home computing assembly,

said home computing assembly being structured to receive an individually addressed code from the remote information services storage center and to cause transfer of digital streams of data from the remote information services storage center to the television broadcast facility and transfer of the digital streams of data from the television broadcast facility to said home computing assembly for storage by said home computing assembly upon comparison and matching of an identification code of said home computing assembly with said individually addressed code as received from said remote information services storage center, and

said home computing assembly including decoder means tuned to a television broadcast channel of said television receiver for monitoring the digital streams of data as transmitted from the television broadcast facility,

said home computing assembly including digital processing means for receiving the digital streams of data by the requesting one of home computing assemblies, and

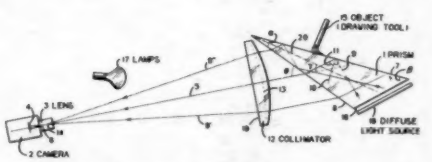
said home computing assembly further including distributed computer processing means for invoking the selected one of said variety of information service programs to perform a task associated with the selected one of said variety of information service programs and means to interact with the selected one of said variety of information service programs as received from the television broadcast facility.

5,181,108

GRAPHIC INPUT DEVICE WITH UNIFORM SENSITIVITY AND NO KEYSTONE DISTORTION

Richard M. Greene, 700 - 31st Ave., #2, San Francisco, Calif. 94121

Filed Oct. 7, 1991, Ser. No. 772,390
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—93 **6 Claims**



1. A graphical input device comprising:

a transparent material with one surface thereof defining a drawing surface, with the index of refraction of the material being greater than the index of refraction of the medium on one side of the drawing surface;

camera means mounted on the other side of said drawing surface and located in a manner to only capture light rays which have been totally internally reflected from said drawing surface whereby an object located on said one side of said drawing surface will be imaged by said camera means only when and where said object is in direct contact with said drawing surface; and

collimator means mounted between said camera means and said drawing surface such that a focal point of said collimator means is substantially coincident with the view-

point of said camera means and the optical axis of said camera means is substantially normal to the whereby the principal image forming rays are parallel when intersecting said drawing surface and are in equal angles with respect to the drawing surface providing uniform sensitivity and whereby the image formed by said camera means is free of keystone distortion.

5,181,109

CIRCUIT OF ELIMINATING MOTIONAL VECTOR REMAINING

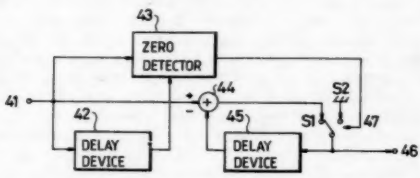
Cheol S. Kang, Seongdong, and Jin H. Lee, Icheon, both of Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyeonaki, Rep. of Korea

Filed Oct. 5, 1991, Ser. No. 788,200

Claims priority, application Rep. of Korea, Nov. 9, 1990, 1990-18105

Int. Cl.[5] H04N *7/01*

U.S. Cl. 358—105 **2 Claims**



1. A circuit of eliminating motional vector remaining caused by transmission error, comprising:

an input terminal for inputting an interframe motional vector;

first delay means connected to the input terminal, for delaying the interframe motional vector as much as a predetermined time;

a zero detector connected to the input terminal and to the first delay means, for detecting that both the delayed interframe motional vector and the interframe motional vector are continuously in zero state more than a predetermined number; and

switching means connected to the zero detector, for forcibly outputting zero("0") just in case that the zero detector detects zero more than the predetermined number.

5,181,110

VIDEO SIGNAL PROCESSING CIRCUIT CAPABLE OF ENLARGING AND DISPLAYING A PICTURE

Kenji Katsumata; Shigeru Hirahata; Masato Sugiyama; Takaaki Matono, all of Yokohama; Kazuo Ishikura, Kanagawa; Sunao Suzuki, Kamakura, and Kazuhiro Kaizaki, Yokohoma, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Video Engineering Inc., Kanagawa, both of, Japan

Continuation of Ser. No. 343,495, Apr. 25, 1989, Pat. No. 5,029,006. This application Dec. 27, 1990, Ser. No. 634,518

Claims priority, application Japan, Apr. 25, 1988, 63-100328

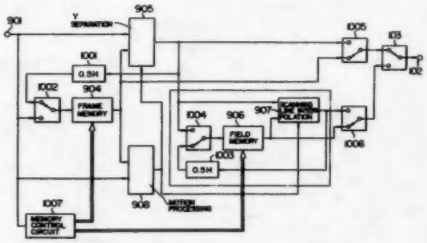
Int. Cl.[5] H04N *5/00*

U.S. Cl. 358—140 **7 Claims**

1. A video signal processing circuit for receiving a video signal which is being subjected to interlace scanning, storing the video signal in a memory and processing the video signal to provide an enlarged video signal, comprising:

enlarged-image scanning line preparation means for producing, from said received video signal, a new video signal including the received video signal and an interpolated scanning line signal which is produced by motion-adaptive interpolation from said received video signal; and

enlargement and memory processing means, including said memory, for storing an output of said enlarged-image scanning line preparation means, and reading from said memory said stored video signal at a read period different from a write period at which an image element signal of



said received video signal is written to produce said enlarged video signal.

5,181,111

VIDEO SIGNAL PROCESSING APPARATUS AND METHOD

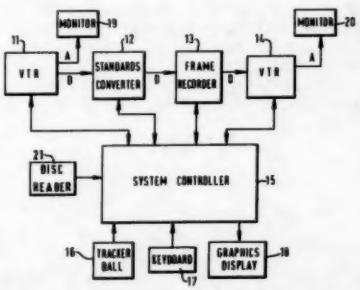
David J. Hedley, Winchester, and Martin R. Dorricott, Basingstoke, both of England, assignors to Sony Broadcast & Communications Limited, Basingstoke, England

Filed Jul. 24, 1991, Ser. No. 735,354

Claims priority, application United Kingdom, Aug. 9, 1990, 9017486

Int. Cl.[5] H04N *5/87, 7/01*

U.S. Cl. 358—140 **12 Claims**



1. A method of converting a video information signal having a first standard format and representing a plurality of scenes having at least one scene discontinuity therebetween to at least one of a motion adaptive video signal and a motion compensated video signal having a second standard format, said method comprising the steps of:

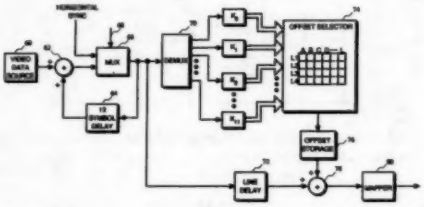
reproducing information stored on a recording medium relating to each said scene discontinuity and comparing the reproduced information to scene information contained in said video information signal so as to identify each said scene discontinuity in said video information signal; and

converting the format of said video information signal at locations other than each identified scene discontinuity on the basis of information obtained from said video information signal on one of an inter-field and inter-frame basis and converting the format of said video information signal at each said identified scene discontinuity on the basis of information obtained from said video information signal on a corresponding one of an intra-field and intra-frame basis so as to obtain at least one of said motion adaptive video signal and said motion compensated video signal having said second format.

5,181,112
TELEVISION SIGNAL TRANSMISSION SYSTEM WITH CARRIER OFFSET COMPENSATION

Richard W. Citta, Oak Park; Scott F. Halozan, Des Plaines, and Gary J. Sgrignoli, Mt. Prospect, all of Ill., assignors to Zenith Electronics Corporation

Filed Mar. 11, 1991, Ser. No. 667,153
Int. Cl.[5] H04N *7/04, 7/00, 11/04*
U.S. Cl. 358—141 **53 Claims**



1. A method of transmitting a video data signal comprising:

providing said data signal in the form of an input sequence of N-level data symbols;

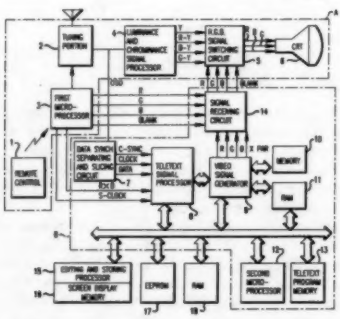
modulo-N offsetting each symbol of said input sequence of N-level data symbols to derive an output sequence of modulo-N offset N-level symbols, the majority of which are characterized by a predetermined level; and

transmitting said output sequence of modulo-N offset N-level symbols.

5,181,113
METHOD OF STORING AND EDITING DATA IN A TELEVISION SYSTEM AND APPARATUS THEREFOR

Dang H. Chang, Kumi, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed May 10, 1991, Ser. No. 698,202
Claims priority, application Rep. of Korea, May 10, 1990, 90-6602
Int. Cl.[5] H04N *7/12*
U.S. Cl. 358—142 **46 Claims**



1. A television receiving system having teletext function adaptable for storing, editing and displaying memo data provided thereto, comprising:

tuner means for receiving broadcast signals, said broadcast signal including a television video signal and teletext data;

means, coupled to said tuner means, for separating said teletext data from said broadcast signal;

data input means, detachable from the rest of the television receiving system, for providing a plurality of key signals each representing selected at least one of operating modes including television, teletext and memo data modes, selected at least one of functions to be performed and memo data;

first processor means, coupled to said data input means and said tuner means, for receiving said key signals and generating various control signals in response thereto;

teletext processor means, coupled to said first processor means and said separating means, including means for generating a key interrupt signal associated with said selected operating mode and function, and means for generating a teletext video information signal in response to said teletext data and a memo data video information signals in response to said key signal representing the memo data;

second processor means, coupled to said teletext processor means, for generating a command signal corresponding to said selected operating mode and function in response to said key interrupt signal;

third processor means, coupled to said teletext processor means and said second processor means, for storing and editing said memo data video information signal in response to said command signal;

first means, coupled to said teletext processor means and said third processor means, for selectively providing said teletext video information signal and said memo data video information signal in response to said command signal;

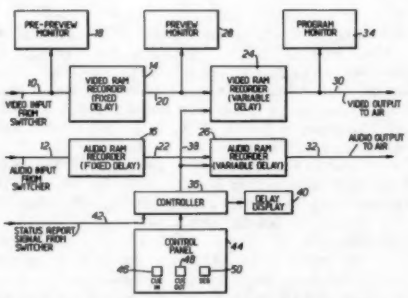
second means, coupled to said first selectively providing means and said tuner means, for selectively providing said television video signal and selectively provided video information signal from said first selectively providing means; and

means, coupled to said second selectively providing means, for displaying video images corresponding to selectively provided signal from said second selectively providing means.

5,181,114
INCLUDING BREAK SLOTS IN BROADCAST VIDEO SIGNALS

John W. Richards, Stockbridge, England; James B. Pearman, Glendale, Calif., and Terry R. Hurley, Newbury, England, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 7, 1991, Ser. No. 666,017
Claims priority, application United Kingdom, Mar. 14, 1990, 9005756
Int. Cl.[5] H04N *7/08, 7/04*
U.S. Cl. 358—146 **15 Claims**



1. A method of including a break slot in a broadcast video signal, the method comprising:

storing the signal in a RAM recorder having a variable delay such that the signal is delayed by a first desired amount;

controllably reading the signal from said variable delay RAM recorder in such a manner that the delay produced by said RAM recorder is reduced from said first desired amount; and

after the delay produced by said variable delay RAM re-

corder has been reduced by a second desired amount, inhibiting reading of the signal from said RAM recorder until the signal delay produced by said RAM recorder has increased again to no more than said first desired amount, such that a break slot is thereby produced having a duration no more than said reduction of the delay produced by said RAM recorder.

5,181,115
DIGITAL PHASE-LOCKED LOOP

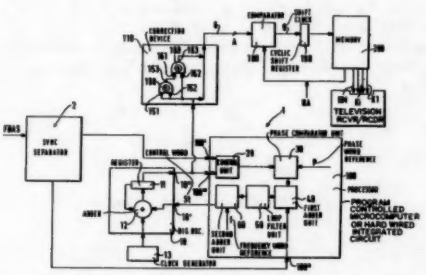
Peter Flamm, March; Martin Winterer, and Hans-Juergen Desor, both of Gundelfingen, all of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Jun. 21, 1991, Ser. No. 718,740

Claims priority, application European Pat. Off., Jun. 30, 1990, 90112531

Int. Cl.[5] H04N *5/04*

U.S. Cl. 358—158 **14 Claims**



1. A digital phased locked loop operative with a television signal comprising:

a controllable digital oscillator for providing at an output a digital output signal of a given period;

a processor coupled to said oscillator for controlling the period of said oscillator;

a sync separator coupled to said processor for providing synchronizing pulses at a nominal period to said processor to enable said processor to compare said pulses with said digital output signal to provide a first control voltage according to the differences in phase between the same;

means for applying said control voltage to said oscillator to lock said oscillator to said nominal period, and means coupled to said digital oscillator to provide at an output a double frequency signal of a second period relatively equal to one half of said nominal period to enable said processor to compare said digital output signal with said double frequency signal to provide a second control voltage for said oscillator, and a second means for applying said second control voltage to said oscillator; and

correction means coupled to said digital oscillator for receiving said digital output signal for generating an address phase signal at an output locked to said digital oscillator signal such that in the presence of a non-periodic synchronizing pulse said address phase signal is shifted to compensate for said non-periodic pulse as undesirably affecting said digital oscillator output signal.

5,181,116
TELEVISION RECEIVER WITH CONTROL OF WRITING AND READING OF VIDEO MEMORY

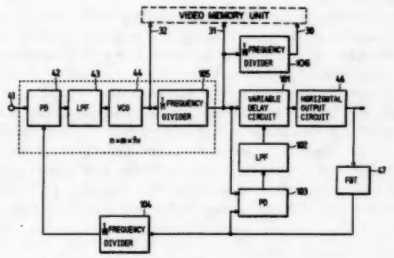
Nobufumi Nakagaki, Tokyo; Toshiyuki Kurita, Yokohama; Toshinori Murata, Yokohama; Kazuhiro Kaizaki, Yokohama; Sadao Kubota, Yokohama; Masanori Kamiya, Yokohama; Hiroshi Sekiya, Yokohama, and Kenichi Fujiwara, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Video Engineering, Inc., Yokohama, both of, Japan

Filed Mar. 7, 1990, Ser. No. 489,509

Claims priority, application Japan, Mar. 10, 1989, 1-56463

Int. Cl.[5] H04N *5/04*

U.S. Cl. 358—159 **22 Claims**



1. A television receiver for performing scanning for an incoming video signal at a frequency m times as high as an input horizontal synchronous frequency by controlling a signal for writing and a signal for reading of a video signal memory unit, comprising a horizontal synchronization/deflection circuit for generating a signal to control the signal for writing and the signal for reading of said video memory unit, said horizontal synchronization/deflection circuit including means for automatically controlling the horizontal position of a picture image displayed on the screen of said television receiver to a predetermined position on the screen, wherein m is an integer.

5,181,117
AUTOMATIC CONTRAST CONTROLLER OF A VIDEO CAMERA

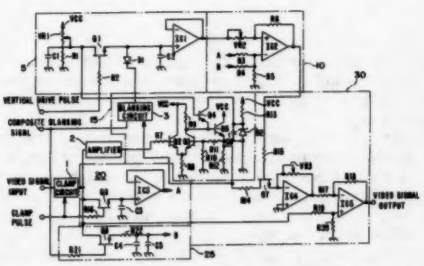
Hae Y. Choi, and Joon H. Lee, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 24, 1989, Ser. No. 383,535

Claims priority, application Rep. of Korea, Aug. 6, 1988, 88-10095

Int. Cl.[5] H04N *5/57*

U.S. Cl. 358—169 **29 Claims**



1. An automatic contrast controller of a video camera, comprising:

pedestal level sample-and-hold means for holding a video signal clamped to a pedestal level by a clamping pulse to provide a clamped video signal;

average signal detecting means for receiving said clamped video signal and a composite blanking signal and for providing an output integrated signal;

signal below reference level detecting means for receiving an amplified clamped video signal and said composite blanking signal so as to detect only signals of said amplified clamped video signal that are below a reference level and for providing a detected output signal;

lowest value detecting means for establishing said reference level and for providing an output in response to the detected output signal having unnecessary signals blanked therefrom in response to said composite blanking signal, said output representing a lowest value of said detected output signal;

means for comparing the output of the lowest value detecting means to the output integrated signal combined with said clamped video signal for providing a variable amplification control signal; and

amplifying means of variable gain for varying the gain of said detected output signal from said signal below reference level detecting means in response to said variable gain amplification control signal, for providing a compensated output signal and for combining said compensated output signal with said clamped video signal to provide an output video signal having high black and white ratio.

5,181,118

METHOD OF CORRECTING IMAGE SIGNAL

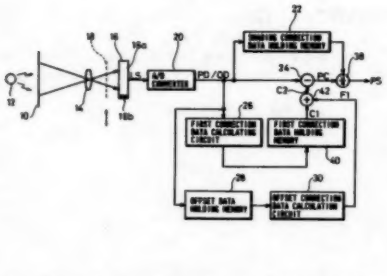
Kei Kimura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 22, 1991, Ser. No. 658,893

Claims priority, application Japan, Mar. 20, 1990, 2-71291

Int. Cl.[5] H04N *3/14*

U.S. Cl. 358—213.16 **3 Claims**



1. A method of correcting an image signal which is suitable for use in reading an image by an image sensor having a black reference pixel and effective pixels, said method comprising the steps of:

detecting a first output signal generated by said effective pixels of said image sensor when a quantity of light at a specified exposure level is applied from a light source to said image sensor via a reference original;

converting said first output signal to a digital signal to obtain a first image data signal;

supplying said first image data signal to a first correction data calculating circuit;

determining first correction data in said first correction data calculating circuit based upon the difference between said first image data signal and reference data corresponding to an ideal characteristic at said specified exposure level, said ideal characteristic being such that outputs detected from all said effective pixels of said image sensor are identical to each other at said specified exposure level;

detecting a second output signal generated by said black reference pixel of said image sensor when said quantity of light at said specified exposure level is applied from said light source to said image sensor via said reference original;

converting said second output signal to a digital signal to obtain a first offset data signal;

replacing said reference original with an image carrying original film;

detecting a third output signal generated by said black reference pixel of said image sensor when said quantity of light at said specified exposure level is applied to said image sensor via said original film;

converting said third output signal to a digital signal to obtain a second offset data signal;

supplying said first offset data signal and said second offset data signal to an offset correction data calculating circuit;

determining an offset correction data in said offset correction data calculating circuit from the difference between said first offset data signal and said second offset data signal;

adding said first correction data to said offset correction data to obtain a second correction data;

detecting a fourth output signal generated by said effective pixels of said image sensor when said quantity of light at said specified exposure level is applied from said light source to said image sensor via said original film;

converting said fourth output signal to a digital signal to obtain a second image data signal; and

subtracting said second correction data from said second image data signal to obtain corrected image data signal.

5,181,119

Patent Not Issued For This Number

5,181,120

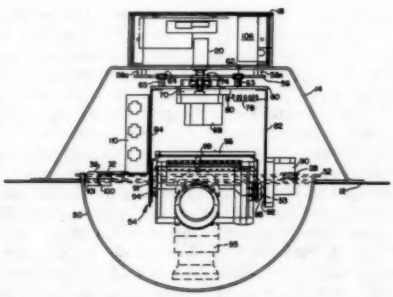
SURVEILLANCE CAMERA SYSTEM

William L. Hickey, Excelsior, and Arie Boers, Plymouth, both of Minn., assignors to Bayport Controls, Inc., Minnetonka, Minn.

Continuation-in-part of Ser. No. 662,966, Mar. 1, 1991, Pat. No. 5,121,215. This application Feb. 19, 1992, Ser. No. 836,952

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—229 **2 Claims**



1. Surveillance camera system comprising:

a. a support;
b. a truncated dome rotatably affixed to said support;
c. a bearing means attached to said support;
d. a truncated dome attached to an upper flange means of said bearing means;
e. a rotation ring attached to and spaced from a lower flange means of said bearing means;
f. a camera assembly means including means for rotating said camera assembly means within said rotation ring;
g. means for rotating said camera assembly between a horizontal access to a vertical access;
h. fixed roller means and spring-biased roller means affixing said camera assembly to said rotation ring; and,
i. means for rotational following of a surveillance dome with said truncated dome.

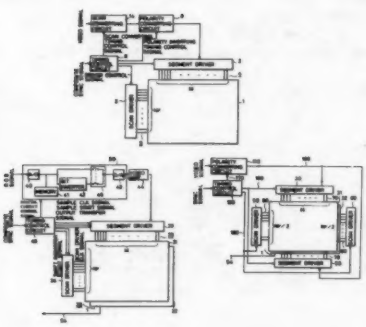
5,181,121

LIQUID CRYSTAL DISPLAY DEVICE AND DRIVING METHOD THEREFORE

Toshio Matsumoto; Shuhei Yasuda; Tokutarou Kusada, and Nobuyoshi Nagashima, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 7, 1990, Ser. No. 476,536
Claims priority, application Japan, Feb. 10, 1989, 1-32324; Nov. 30, 1989, 1-313663
Int. Cl.[5] H04N 5/74
U.S. Cl. 358—236 **16 Claims**

4. A liquid crystal display device for driving liquid crystal pixels in response to original video signals of interlace specification, comprising:



a liquid crystal panel including scan signal lines, the number of which is substantially equal to the number of valid scan lines of 1 frame of television signals, and a plurality of rows of liquid crystal pixels each connected to said scan signals lines, each of said rows of liquid crystal pixels including a plurality of liquid crystal pixels;

scan signal line driving means for successively driving pairs of adjacent scan signal lines in a first combination in a first field out of first and second fields constituting 1 frame and for successively driving pairs of adjacent scan signal lines in a different combination in said second field; and

pixel driving means for driving, responsive to said original video signals, the liquid crystal pixels connected to said scan signal lines driven by said scan signal line driving means,

wherein said scan signal line driving means, includes

first scan driver means connected to odd numbered ones of said scan signal lines for successively scanning and driving these signal lines one by one,

second scan driver means connected to even numbered ones of said scan signal lines for successively scanning and driving these signal lines one by one, and

controlling means for simultaneously starting operations of said first and second scan driver means in said first field and for making an operation start timing of said first scan driver means different from that of said second scan driver means by 1 horizontal scanning period in said second field.

5,181,122

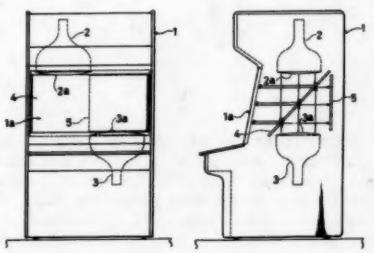
DISPLAY DEVICE FOR DISPLAYING A WIDE PICTURE

Toshimitsu Ooishi, Kobe, Japan, assignor to Konami Kogyo Kabushiki Kaisha, Kobe, Japan

Continuation of Ser. No. 685,805, Apr. 15, 1991, abandoned. This application Jun. 8, 1992, Ser. No. 895,207
Claims priority, application Japan, Jun. 26, 1990, 2-169288
Int. Cl.[5] H04N 5/74
U.S. Cl. 358—238 **6 Claims**

3. A display device for displaying a wide picture comprising:

a) a main screen over which the wide picture is to be produced;



b) first picture projector means for producing a first picture and for transmitting the first picture to said main screen, said first picture projector means including a picture generation unit having:

i) a first screen extending in a first plane and facing in a first direction, and

ii) first picture transmission means for transmitting a picture produced on the first screen to the main screen, the first picture transmission means including first mirror means inclined with respect to the first direction for reflecting light from the first screen to the main screen;

c) second picture projector means for producing a second

picture and for transmitting the second picture to said main screen, said second picture projector means including a picture generation unit having:

i) a second screen extending in a second plane which is parallel to said first plane and facing in a second direction opposite to the first direction, the second plane being spaced from said first plane along said first and second directions, and

ii) second picture transmission means for transmitting a picture produced on the second screen to the main screen, the second picture transmission means including second mirror means inclined with respect to the second direction for reflecting light from the second screen to the main screen, with the direction of inclination of said second mirror means being at an opposite inclination to the inclination of said first mirror means; and

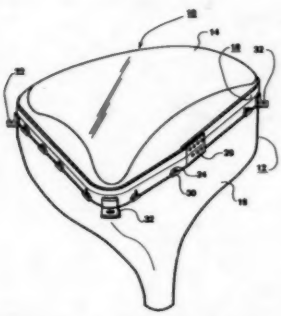
d) the first picture projector means and the second picture projector means being arranged so that an image from said first picture projector means is displayed on said main screen in non-overlapping juxtaposition to an image from said second picture projector means.

5,181,123

CATHODE-RAY TUBE HAVING A SHRINKFIT IMPLOSION PROTECTION BAND WITH TENSION LIMITING MEANS

Harry R. Swank, Lancaster, Pa., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Mar. 29, 1991, Ser. No. 677,178
Int. Cl.[5] H04N *5/65*
U.S. Cl. 358—246 **3 Claims**



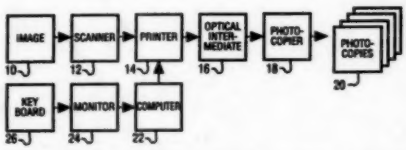
3. In a cathode-ray tube comprising an evacuated envelope having a faceplate panel joined to a funnel and a shrinkfit implosion protection band of at least one strip of metal having opposite ends secured together to a connective joint, said joint having a minimum design limit which, if exceeded, will cause failure of said joint, and said band being formed into a loop with cold dimensions slightly smaller than the periphery of said panel prior to application of said band, said band having a given sectional area with a plurality of openings formed therein, each of said openings having a base spaced from an edge of said band, each of said openings accommodating a clip which accurately locates a degaussing coil, said band being fitted around the periphery of said panel to apply a compressive force thereto as a result of the tension of said band, the improvement wherein said band includes a slot in communication with each of said openings for lowering said tension of said band below the minimum design limit of said connective joint, each of said slots having a base with a dimension smaller than a dimension of said base of said corresponding openings, said clips being located and retained within said openings without interference from said slots.

5,181,124

OPTICAL INTERMEDIATE PRODUCED BY A CALIBRATED PRINTER FOR USE IN AN ELECTROPHOTOGRAPHIC COPIER TO COMPENSATE FOR DETERMINABLE COPIER REPRODUCTION CHARACTERISTICS

Richard C. Close, Winchester; H. Scott Gregory, Jr., Bedford, and Douglas G. Walker, Billerica, all of Mass., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 20, 1991, Ser. No. 810,424
Int. Cl.[5] H04N *1/29, 1/387, 1/46;* **G03G** *15/01*
U.S. Cl. 358—300 **17 Claims**



11. An arrangement for providing multiple photocopies of an original image, comprising:

means for photocopying having determinable reproduction characteristics; and

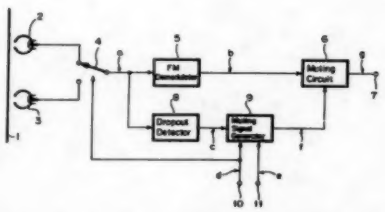
means for producing an optical intermediate representing the original image in a manner which compensates for the determinable reproduction characteristics of the means for photocopying.

5,181,125

APPARATUS FOR MUTING NOISE RESULTING FROM REPRODUCING OF A PCM AUDIO SIGNAL RECORDED IN AN EXTENSION OF A SLANT TRACK CONTAINING A RECORDED VIDEO SIGNAL

Hiroshi Kawakami, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 10, 1991, Ser. No. 757,232
Claims priority, application Japan, Sep. 28, 1990, 2-25968
Int. Cl.[5] H04N *5/783*
U.S. Cl. 358—336 **7 Claims**



1. An apparatus for reproducing main information signals recorded in slant tracks on a magnetic tape which further has respective auxiliary information signals recorded in extensions of the slant tracks with predetermined gaps between the recorded auxiliary information signals and the main informations signals recorded in the respective slant tracks, said apparatus having a normal reproducing mode in which the magnetic tape is advanced at a recording speed and another reproducing mode in which the magnetic tape is advanced at a speed different from said recording speed, said apparatus comprising:

rotary magnetic heads scanning said slant tracks and said extensions thereof for providing reproduced head outputs containing the main and auxiliary information signals reproduced from the magnetic tape with dropouts in said reproduced head outputs corresponding to the gaps be-

tween the respective recorded main and auxiliary information signals;

signal extracting means receiving said reproduced head outputs and being responsive to a predetermined timing signal for providing an extracted output which, in said normal reproducing mode, consists of said reproduced main information signals and, in said other reproducing mode, also includes said dropouts and noises corresponding to at least portions of the reproduced auxiliary information signals;

means responsive to said extracted output for detecting said dropouts therein and providing respective dropout detected pulses in said other reproducing mode;

muting means receiving said extracted output and being operative, in response to muting signals, for muting said extracted output; and

means for generating each of said muting signals in response to a respective one of said dropout detected pulses so as to cause said muting means to be operative for a period corresponding to the duration of the respective dropout and the following noise so as to eliminate from the extracted output in said other reproducing mode said noises due to said auxiliary information signals contained therein.

5,181,126
READING DEVICE FOR FACSIMILE APPARATUS

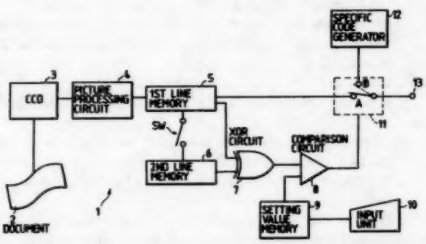
Eiichi Morimoto, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 475,025, Feb. 5, 1990, abandoned. This application Dec. 9, 1991, Ser. No. 803,727

Claims priority, application Japan, Feb. 9, 1989, 1-14493[U]

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—426 **5 Claims**



1. A document reader in a facsimile apparatus comprising:

first memory means for storing a current line of data obtained by scanning a document in a predetermined scanning direction, the data including picture elements,

second memory means for storing a previously scanned line of data, the data including picture elements,

means for comparing the picture elements of the current line of data to corresponding picture elements of the previously scanned line of data,

means for calculating an amount of changed picture elements between the current line of data stored in the first memory means and the previous line of data stored in the second memory means,

means for generating a specific signal having a signal duration shorter than a signal representing said current line of data,

means for comparing the calculated amount of changed picture elements with a predetermined value and producing an output signal indicative thereof, and

means for transmitting the signal representing the current line of data stored in the first memory means or the generated specific signal in response to the signal from the means for comparing.

5,181,127
IMAGE FORMING APPARATUS AND METHOD THEREFOR

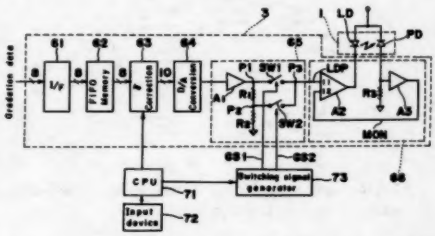
Shigeo Ogino, Toyokawa, and Masaaki Nishiyama, Toyohashi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 13, 1990, Ser. No. 552,083

Claims priority, application Japan, Jul. 17, 1989, 1-185263

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—443 **7 Claims**



1. An image forming apparatus for forming an image on a recording medium by scanning a laser beam on said recording medium including:

reading means for reading a halftone image and a character image and outputting analog image signals having a plurality of gradations,

an amplifier means for amplifying said analog signals,

a laser emitting means for scanning a laser beam on said recording medium so as to produce an image of the original on said recording medium,

a driving means for supplying an energizing current responsive to said analog signals amplified to said laser emitting means, and

an altering means for altering the gain of said amplifier means so as to amplify image signals responsive to said halftone image at a first amplification degree and image signals responsive to said character image at a second amplification degree higher than the first one.

5,181,128
METHOD AND APPARATUS FOR READING IMAGE USING A LINE IMAGE SENSOR

Yasushi Fukatsu, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 16, 1991, Ser. No. 760,362

Claims priority, application Japan, Sep. 17, 1990, 2-246443

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—486 **8 Claims**

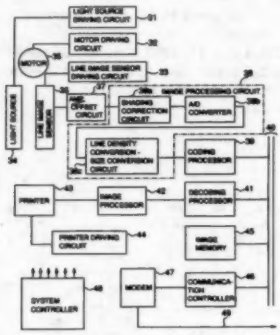
2. An apparatus for reading optical image information using a line image sensor, said image reading apparatus comprising:

feed means for feeding a medium with said optical image information represented thereon in the sub-scanning direction perpendicular to the lengthwise direction of the row of pixels, so that said line image sensor may read said optical image information in the sub-scanning direction;

control means for controlling said feed means so that the spatial frequency in the reading in the sub-scanning direction may become higher than the spatial frequency in the reading in the main scanning direction parallel to the lengthwise direction; and

line density conversion means for converting an electric

signal output from said line image sensor upon its reading said optical image information so that the line density in



the sub-scanning direction and the line density in the main scanning direction may concur.

5,181,129

ELECTRONIC BLACKBOARD

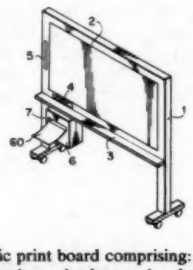
Kunio Sato; Susumu Akimaru, both of Hitachi; Nobuyoshi Hoshi, and Yasuro Hori, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 8, 1990, Ser. No. 490,467

Claims priority, application Japan, Mar. 17, 1989, 1-063747

Int. Cl.[5] H04N *1/04*

U.S. Cl. 358—494 **13 Claims**



1. An electronic print board comprising:

a flat board having a background color and adapted for presentation thereon of an image in a different color;

input means, including a single photoelectric conversion element, for scanning in a single scanning line an image presented on said flat board or in substantially the same scanning line an image on an original document and converting the scanned image into an electrical signal;

image converging and projecting means for converging the reflected light from the scanning line on the image written on said flat board or from the scanning line on the image on the original document to provide on said single photoelectric conversion element in substantially equal sizes a projected image of the scanning line on the image on the original document or a projected image of the scanning line on the image on said flat board;

recording means responsive to the electrical signal for recording the projected image; and

flat board writing means responsive to the electrical signal for presenting on said flat board an image of the projected image.

5,181,130

FIBER OPTIC FACEPLATE LIQUID CRYSTAL DISPLAY

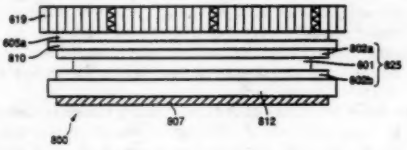
Laurence M. Hubby, Jr., Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 462,679, Jan. 9, 1990, Pat. No. 5,035,490. This application Oct. 24, 1990, Ser. No. 602,842

The portion of the term of this patent subsequent to Jul. 30, 2008, has been disclaimed.

Int. Cl.[5] G02F *1/1335, 1/1333*

U.S. Cl. 359—42 **20 Claims**



1. A direct view image display apparatus, comprising:

a) a reflecting liquid crystal display (LCD) device;

i) formed for operating in a nondynamic scattering mode; and

ii) having an LCD surface;

b) a fiber optic faceplate;

i) having an upper face and a lower face;

ii) positioned with the lower face facing the LCD surface;

iii) having a multiplicity of straight and rigid optical fibers whose longitudinal axes are parallel to each other and substantially perpendicular to;

1) the upper face and the lower face of the faceplate; and

2) the LCD surface;

iv) each of the fibers being formed to cooperate with the reflective LCD surface to collect and project through the faceplate any of a plurality of light rays emitted by an ambient light source if any, thereby enhancing the visibility of the image displayed on the upper face of the faceplate;

c) a polarizer;

i) positioned between the LCD surface and the faceplate; and

ii) formed for polarizing the light passing between the LCD surface and the faceplate; and

d) a transparent layer positioned between the LCD surface and the polarizer;

the polarizer and the transparent layer spacing said LCD device apart from the faceplate by a cap n, wherein n is sufficiently small to limit the optical fibers through which light rays from a particular area of the LCD surface can be projected.

5,181,131

POWER CONSERVING DRIVER CIRCUIT FOR LIQUID CRYSTAL DISPLAYS

Shunpei Yamazaki, Tokyo, and Akira Mase, Atsugi, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Division of Ser. No. 726,165, Jul. 2, 1991, Pat. No. 5,107,354, which is a continuation of Ser. No. 431,454, Nov. 3, 1989, abandoned. This application Dec. 23, 1991, Ser. No. 812,034

Claims priority, application Japan, Nov. 11, 1988, 63-286466

The portion of the term of this patent subsequent to Apr. 21, 2009, has been disclaimed.

Int. Cl.[5] G02F *1/13*

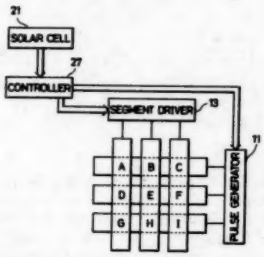
U.S. Cl. 359—56 **4 Claims**

1. Apparatus for conserving the battery power supply of a liquid crystal display including a pair of substrates, a liquid crystal layer having a non-volatile property, and an electrode arrangement corresponding to an m×n matrix of picture elements where all said picture elements are elements of a display picture to be displayed by said display, said electrode arrange-

ment being adapted to apply electric fields to aid liquid crystal layer for displaying said picture, said apparatus comprising:

means for applying first electric fields for a first period of time to said liquid crystal layer to display a first display picture;

means for removing said first electric fields for a second



period of time greater than said first period of time whereby the first display picture continues to be displayed due to the non-volatile property of the liquid crystal layer; and

means for applying second electric fields to said liquid crystal display to change the picture displayed by the display from said first display picture to a second display picture.

5,181,132

LIQUID CRYSTAL DEVICE AND METHOD FOR PRODUCING THE SAME WITH METAL SPACER IN HOLE OF THIN FILM DEVICE'S INSULATOR

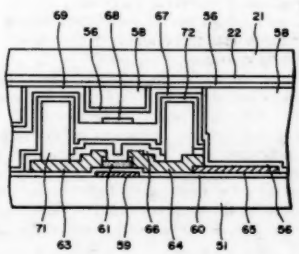
Hitoshi Shindo, Isehara, and Jun Nakayama, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1991, Ser. No. 708,219

Claims priority, application Japan, May 31, 1990, 2-139617; Jul. 10, 1990, 2-181977

Int. Cl.[5] G02F *1/1343, 1/1339*

U.S. Cl. 359—58 **7 Claims**



1. An electronic device, comprising:

a liquid crystal display comprising: a pair of substrates, a liquid crystal material disposed between said substrates, and a thin film device provided on one of said substrates;

an insulating film disposed on said thin film device, said insulating film being provided with a hole which exposes a conductive or semiconductive portion of said thin film device; and

a metallic body serving as a spacer;

wherein said metallic body is formed on said conductive or semiconductive portion via said hole.

5,181,133

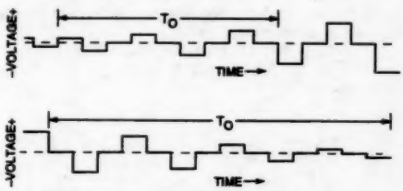
DRIVE METHOD FOR TWISTED NEMATIC LIQUID CRYSTAL SHUTTERS FOR STEREOSCOPIC AND OTHER APPLICATIONS

Lenny Lipton, Greenbrae, Calif., assignor to StereoGraphics Corporation, San Rafael, Calif.

Filed May 15, 1991, Ser. No. 700,558

Int. Cl.[5] G02F *1/13; G09G 3/00*

U.S. Cl. 359—84 **23 Claims**



1. A method for driving a shutter including a twisted nematic liquid crystal cell, between a low voltage state in which a low peak-to-peak voltage signal is applied to the cell, and a shuttering state in which a high peak-to-peak voltage signal is applied to the cell, said method including the steps of:

(a) applying a first one of the low peak-to-peak voltage signal and the high peak-to-peak voltage signal to the cell;

(b) then, applying a transition signal to the cell for a transition period, where the transition signal has an envelope whose amplitude varies monotonically over the transition period; and

(c) then, applying the other of the low peak-to-peak voltage signal and the high peak-to-peak voltage signal to the cell.

5,181,134

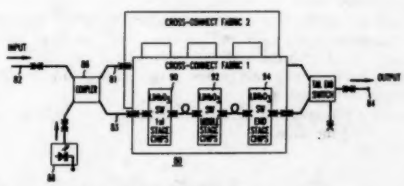
PHOTONIC CROSS-CONNECT SWITCH

Mohammad T. Fatehi, Middletown, and Nattu V. Srinivasan, Eatontown, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 15, 1991, Ser. No. 669,840

Int. Cl.[5] H04J *14/00*

U.S. Cl. 359—117 **8 Claims**



1. An optical cross-connect switch comprising

a first group of crystals of dielectric material

a first group of waveguides supported by said first group of crystals of dielectric material for carrying optical signals from an input port to a selected output port,

a first group of switching means coupled to said waveguides for selectively switching optical signals from said input ports along selective waveguides to said output ports,

a second group of crystals of dielectric material,

a second group of waveguides supported by said second group of crystals of dielectric material for carrying optical signals from an input port to a selected output port,

a second group of switching means coupled to said waveguides for selectively switching optical signals from said input ports along selective waveguides to said output ports,

optical fibers interposed between the output ports of said

first group of waveguides and the input ports of said second group of waveguides to form an optical fiber interconnect web,

said optical fibers comprise optical fiber amplifiers, and

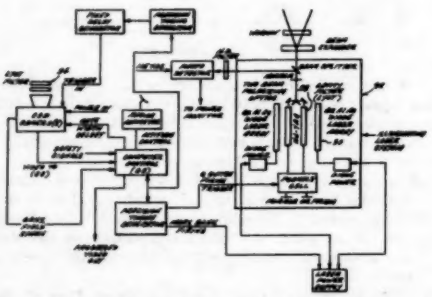
pump means coupled to pump said optical fiber amplifiers from a remote location.

5,181,135

OPTICAL UNDERWATER COMMUNICATIONS SYSTEMS EMPLOYING TUNABLE AND FIXED FREQUENCY LASER TRANSMITTERS

R. Norris Keeler, McLean, Va., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Dec. 21, 1990, Ser. No. 632,398
Int. Cl.[5] H04B *10/00*
U.S. Cl. 359—141 **30 Claims**



17. An apparatus for underwater communication between a first above water location and a second underwater location, the first location including a laser transmitter positioned to transmit laser light toward the second location, comprising:

means for tuning or setting the operational wavelength of the laser transmitter to a selected wavelength, said selected wavelength being selected so as to optimize the performance of said laser transmitter with at least one of (1) the depth of the water at the second location and (2) the Jerlov Class of the water at the second location;

means for generating short pulses of light from the laser transmitter in accordance with a selected message to be communicated;

means for projecting said short pulses of light toward the underwater location and at first filter receiver means associated with the underwater location;

means for detecting said pulses of light using said first filter receiver means; and

means for converting said detected pulses of light to said selected message.

5,181,136

OPTICAL HOMODYNE DPSK RECEIVER WITH OPTICAL AMPLIFIER

Mohsen Kavehrad, Cumberland, Canada, and Mansour I. Irshid, Ibrid, Jordan, assignors to The University of Ottawa, Ottawa, Canada

Filed Sep. 20, 1990, Ser. No. 586,132
Claims priority, application Canada, Sep. 22, 1989, 6126855
Int. Cl.[5] H04B *10/06*
U.S. Cl. 359—190 **20 Claims**

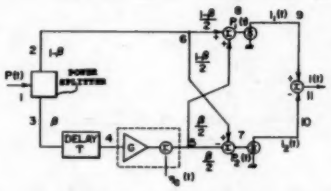
1. An optical homodyne differential phase shift keying receiver for receiving and demodulating optical signals, comprising:

input means for receiving an optical signal;

power splitting means for splitting said received optical signal into first and second signals, said first and second signals being transmitted away from said power splitting means on respective first and second optical paths;

delay means in the second optical path for delaying said second signal to thereby produce a delayed second signal;

optical amplifying means for receiving said delayed second signal and optically amplifying said delayed second signal to thereby produce a delayed amplified second signal; and



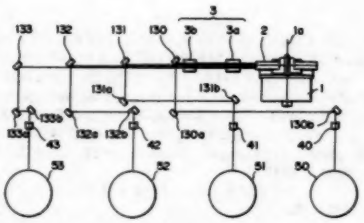
balanced noise reduction circuit means for receiving said delayed amplified second signal from the optical amplifying means and said first signal from said power splitting means, and for combining said first signal and said delayed amplified second signal to produce a demodulated output signal.

5,181,137

LIGHT SCANNING APPARATUS

Jun Koide, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 396,357, Aug. 21, 1989, abandoned. This application Dec. 21, 1990, Ser. No. 630,788
Claims priority, application Japan, Aug. 24, 1988, 63-210165
Int. Cl.[5] G02B *26/08*
U.S. Cl. 359—217 **46 Claims**



1. A light scanning apparatus comprising:

a light source having a plurality of light emitting units;

a deflector for deflecting a plurality of light beams emanated from said light source;

a first optical system for focusing the plural light beams deflected by said deflector, said first optical system being afocal in a refractive power in a sub-scan direction and exhibiting an f-θ characteristic in a refractive power in a scan direction; and

a second optical system positioned in proximity to a predetermined plane for directing the light beams from said first optical system to the predetermined plane, said second optical system being provided for each of the light beams.

5,181,138

FAST ACQUISITION OPTICAL FREQUENCY LOCKED LOOP

Dennis W. Davis, Boca Raton, and Stanley Scalise, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 31, 1992, Ser. No. 829,793
Int. Cl.[5] G02B *26/00*; **H04B** *10/06*
U.S. Cl. 359—239 **10 Claims**

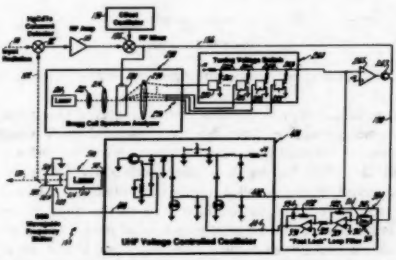
1. An optical system incorporating a feedback control loop for controlling an optical output wavelength of an optical

output beam to match an incoming frequency and wavelength of an incoming optical signal having an incoming signal wavelength comprising:

signal comparison means for comparing said incoming optical signal with a loop optical signal to form an rf beat signal;

a voltage controlled oscillator for generating an rf control signal, having an rf control frequency, that controls said loop optical signal in frequency;

coarse frequency control means, connected to said signal comparison means, for generating a coarse tuning control signal by applying said rf beat signal to an acousto-optic modulator that deflects a beam from a local optical source to strike one of a plurality of optical detectors disposed transversely from a local source axis, whereby that one of said plurality of optical detectors receiving deflected radiation passes a signal to a voltage switch that generates a tuning voltage having one of a predetermined set of tuning voltage values and applies said tuning voltage as



said coarse tuning control signal to a first input of said voltage controlled oscillator;

fine tuning control means, connected to said signal comparison means and to said voltage switch, for generating and applying a fine tuning control signal to a second input of said voltage controlled oscillator, including a loop filter for filtering said beat frequency to generate therefrom said fine tuning control signal and applying said fine tuning control signal to a second input of said voltage controlled oscillator after a relative delay after said tuning voltage;

an output frequency shifting unit, connected to an output of said voltage controlled oscillator and to a local optical source, for frequency modulating a loop optical beam, having a loop frequency, passing therethrough to generate an optical output beam having said output frequency; and

optical feedback means disposed to intercept said optical output beam for transporting a fraction of said optical output beam to said signal comparison means, whereby said loop operates to drive said output wavelength to match said incoming signal wavelength.

5,181,139

RETRACTABLE BINOCULARS ATTACHABLE TO A VISOR

Jose A. Benitez, 5705 W. 12th La., Hialeah, Fla. 33012

Filed Nov. 4, 1991, Ser. No. 787,620

Int. Cl.[5] G02B *23/18*; A42B *1/24*

U.S. Cl. 359—408 **16 Claims**

1. For use in combination with head wear, a binocular assembly adapted to be attached to an underside of a visor of the head wear, said assembly comprising:

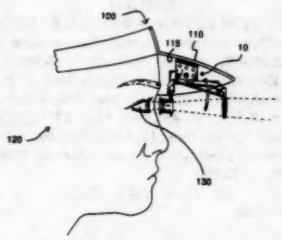
a supporting frame member including a proximal end and a distal end, said frame member having a top surface structured and disposed for mating engagement with said underside of said visor;

a pair of objective lenses, including a left objective lens and a right objective lens movably mounted to said distal end of said frame member in spaced, co-planar relation to one another;

a pair of eye-piece lenses, including a left eye-piece lens and a right eye-piece lens movably mounted to said proximal end of said frame member in spaced, co-planar relation to one another,

said left objective lens being in axial alignment with said left eye-piece lens and said right objective lens being in axial alignment with said right eye-piece lens when in an extended, operable position;

linkage means interconnecting said object lenses to said eye-piece lenses for facilitating simultaneous movement thereof between said extended, operable position, and a collapsed, stored position when said assembly is attached to said underside of said visor; and



means for longitudinally and continuously moving said objective lenses relative to said eye-piece lenses using an adjustment means, while said assembly is attached to said underside of said visor, so as to facilitate focusing on an object,

said assembly, when attached to said underside of said visor worn by a user, being structured and disposed to be substantially nonobstructive to the vision of said user when said pair of objective lenses and said pair of eye-piece lenses are in said collapsed, stored position.

5,181,140

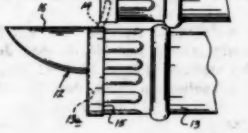
BINOCULAR SHIELD

Johnny L. Brown, and Donna D. Brown, both of Rte. #2, Box 507-B, Robbins, N.C. 27325

Filed Mar. 27, 1991, Ser. No. 675,851

Int. Cl.[5] G02B *11/04, 21/00*

U.S. Cl. 359—507 **1 Claim**



1. A binocular shield for securement to a binocular assembly, wherein the binocular assembly includes a plurality of binocular legs, each leg mounting a binocular lens adjacent a forward terminal end of each binocular leg, wherein the binocular shield comprises,

a plurality of shield members, each shield member including a cylindrical band, each cylindrical band formed of a resilient material for securement about each binocular leg adjacent a forward terminal end of each binocular leg, with each cylindrical band including a hook member fixedly and coextensively mounted to a side edge of each cylindrical band,

each shield member includes a joinder strap, with the joinder

strap joined to each cylindrical band to join the shield members in a unitary assembly,

each hook member includes a convex exterior surface and is mounted to each cylindrical band to define an arc between one hundred forty and two hundred seventy degrees, and

each hood member includes a plurality of parallel enclosed cylindrical cavities and cylindrical rods, wherein each cylindrical rod positioned within each cylindrical cavity is deformable to provide manual contouring of each hood member.

5,181,141

ANTI-REFLECTION OPTICAL ELEMENT

Koji Sato, Akigawa; Tokio Suzuki, Sagamihara; Hajime Kamiya, Kokubunji; Kimio Nakamura, Musashimurayama; Masahisa Kosaka, and Tetsuo Ohsora, both of Nishitama, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Continuation of Ser. No. 499,686, Mar. 27, 1990, abandoned. This application Feb. 24, 1992, Ser. No. 839,684

Claims priority, application Japan, Mar. 31, 1989, 1-083391; Apr. 28, 1989, 1-111499

Int. Cl.[5] G02B *1/10, 5/28*

U.S. Cl. 359—580 **11 Claims**

1. An anti-reflection optical element comprising (i) an optical component made of a plastic and (ii) a multi-layered anti-reflection film provided directly or indirectly on said optical component, said film comprising at least one low refractive index film layer and at least one high refractive index film layer, said low refractive index film layer and said high refractive index film layer being laminated alternately on said optical component, said high refractive index film layer being a film of mixed metal oxides comprising tantalum oxide, zirconium oxide and yttrium oxide, deposited by evaporation process.

5,181,142

PLASTIC LENS AND METHOD OF FORMING AN ANTI-REFLECTING LAYER ON A PLASTIC LENS

Kazuo Asai, and Masaharu Kikuchi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 690,325, Apr. 26, 1991, Pat. No. 5,116,644, which is a continuation of Ser. No. 363,682, Jun. 9, 1989, abandoned. This application Mar. 10, 1992, Ser. No. 847,274

Claims priority, application Japan, Jun. 10, 1988, 63-143128

Int. Cl.[5] G02B *1/10*

U.S. Cl. 359—581 **10 Claims**

7. An anti-reflecting plastic lens comprising a plastic lens and a hard coat layer formed on said lens, said hard coat layer containing at least one silane coupling agent, at least one epoxy resin, and a plurality of oxide particles, said hard coat layer having a thickness defined between an outer surface of said hard coat layer and an inner surface of said hard coat layer proximate said lens, said oxide particles having a concentration which varies in the direction of said thickness of said hard coat layer, said concentration of oxide particles increasing from said outer surface to said inner surface of said hard coat layer such that the index of refraction of said hard coat layer varies in said direction of thickness of said hard coat layer, thereby imparting an anti-reflecting effect to said plastic lens.

5,181,143

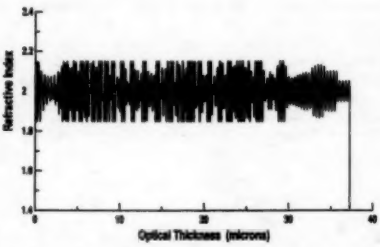
MULTIPLE LINE RUGATE FILTER WITH INDEX CLIPPING

William H. Southwell, Thousand Oaks, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Oct. 3, 1991, Ser. No. 770,802

Int. Cl.[5] G02B *5/28*; B05D *5/06*

U.S. Cl. 359—586 **10 Claims**



8. A rugate filter having multiple reflectance bands, comprising:

a thin film comprising a first optical material producing an upper refractive index limit codeposited with a second optical material producing a lower refractive index limit;

said thin film having a gradient refractive index profile derived from a parallel sum of individual refractive index profiles required to produce each of the multiple reflectance bands, said parallel sum having peak-to-peak amplitude variations exceeding said upper and lower refractive index limits; and

said gradient refractive index profile having upper and lower refractive index excursions bounded by said upper and lower refractive index limits.

5,181,144

INITIAL FOCUSING MECHANISM FOR ZOOM LENS SYSTEM

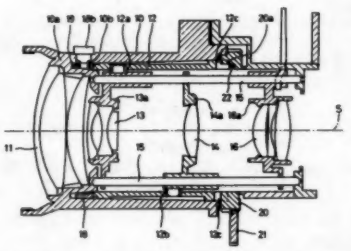
Nobuyuki Shirie, and Kazunori Ohno, both of Ohmiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Ohmiya, Japan

Filed Sep. 25, 1991, Ser. No. 765,531

Claims priority, application Japan, Sep. 28, 1990, 2-259717

Int. Cl.[5] G02B *15/14*

U.S. Cl. 359—700 **5 Claims**



1. An initial focusing mechanism for a zoom lens system comprising:

a cylinder cam contained within a barrel for rotational movement and slidable movement along an optical axis both with respect to said barrel;

a variator and a compensator held by a variator frame and a compensator frame, respectively, which are, in turn, respectively supported by said cylinder cam by engagement with a pair of cam tracks formed in said cylinder cam;

slide means adapted for slidably moving said cylinder cam

along the optical axis with respect to said barrel and for adjustment of an amount by which said cylinder cam is slidably moved to achieve a desired initial focusing; and

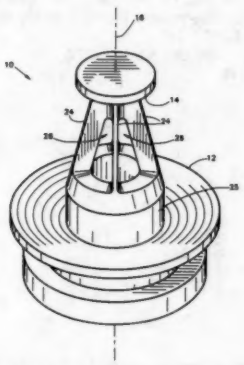
means for rotating said cylinder cam with respect to the barrel to move said variator and compensator along the optical axis for continuous change of a focal distance.

5,181,145

OPTICAL IMAGING SYSTEM MADE FROM A SINGLE PIECE OF MATERIAL

Benjamin Eden, Haifa, Israel, assignor to State of Israel - Ministry of Defence Armament Development Authority, Haifa, Israel

Filed Feb. 27, 1991, Ser. No. 661,677
Claims priority, application Israel, Mar. 14, 1990, 93738
Int. Cl.[5] G02B *5/10*
U.S. Cl. 359—859 **13 Claims**



1. An optical imaging system integrally-formed on a single piece of material, comprising:

at least a first and second facing, reflective surfaces defining a single optical axis,

said first reflective surface defining a central aperture through which said optical axis extends and said second reflective surface formed coaxially with said first reflective surface and defining a focus lying on said optical axis,

radiation impinging on said first reflective surface being reflected therefrom towards said second reflective surface and further reflected from said second reflective surface towards said focus; and

a plurality of elongate rib members integrally formed with said first and second reflective surfaces, said plurality of elongate rib members defining therebetween a plurality of openings communicating with said central aperture, so as to enable passage of radiation reflected from said second reflective surface to said focus thereof.

5,181,146

APPARATUS FOR DIGITALLY RECORDING AND REPRODUCING VIDEO AND AUDIO SIGNALS IN SKEWED TRACKS ON A RECORD TAPE

Hirohisa Koga, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

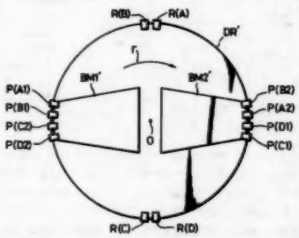
Filed Oct. 13, 1989, Ser. No. 421,063
Claims priority, application Japan, Oct. 18, 1988, 63-261860
Int. Cl.[5] G11B *5/02*; H04N *5/78*
U.S. Cl. 360—19.1 **7 Claims**

1. An apparatus for digitally recording and reproducing video and audio signals in successive parallel tracks on a record tape while the latter is advanced in a longitudinal direction at an angle to the direction along said tracks, said apparatus comprising:

a rotary drum;

first transducing means mounted on said rotary drum and operative in a recording mode for recording the video and audio signals in a digital form on said record tape, said first transducing means including first and second pluralities of recording heads fixedly mounted on said rotary drum at diametrically opposed positions so that one field of the video and audio signals is recorded in a plurality of parallel record tracks of a predetermined pitch scanned by said first and second pluralities of recording heads as the record tape is advanced at a predetermined speed in said longitudinal direction;

first and second bimorph leaves mounted at respective opposed positions on said rotary drum intermediate said positions at which said first and second pluralities of recording heads are mounted; and



second transducing means operative in a reproducing mode and being mounted on said bimorph leaves for scanning said parallel tracks, said second transducing means including first and second pluralities of reproducing heads mounted on said first and second bimorph leaves, respectively, so that each of said first and second pluralities of reproducing heads can be deflected by the respective one of said first and second bimorph leaves in a direction transverse to said direction along the tracks when, in said reproducing mode, the tape is advanced at a speed different from said predetermined speed, the number of said reproducing heads in each of said first and second pluralities thereof being larger than the number of said recording heads in each of said first and second pluralities of recording heads for relatively reducing the maximum deflections of said reproducing heads by said bimorph leaves needed to ensure that each of the reproducing heads can accurately reproduce a digital video signal recorded in one of the record tracks being scanned thereby when the record tape is advanced at said different speed.

5,181,147

ROTARY HEAD ASSEMBLY FOR SUBSTANTIALLY CONCURRENT RECORDING AND MONITORING OF DATA ON A MAGNETIC TAPE CASSETTE OR THE LIKE

Toshihiko Hamada, Tokyo, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed May 19, 1989, Ser. No. 354,152
Claims priority, application Japan, May 27, 1988, 63-130547
Int. Cl.[5] G11B *27/36, 5/09, 15/14*
U.S. Cl. 360—31 **6 Claims**

1. A magnetic tape apparatus of the type having a rotary heat assembly for the storage and retrieval of digital data on and from a series of slanting record tracks on magnetic tape, wherein the improvement resides in the rotary head assembly comprising:

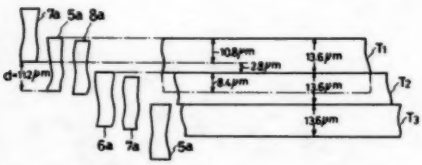
a) a rotary drum;

b) a first read/write head mounted on the rotary drum for reading and writing data on the magnetic tape;

c) a second read/write head mounted on the rotary drum for reading and writing data on the magnetic tape, the second

read/write head being angularly spaced 180 degrees from the first read/write head, the first and second read/write heads alternately scanning the magnetic tape for creating a series of slanting record tracks thereon;

d) a first monitor head mounted on the rotary drum for monitoring the data written on the magnetic tape by the first read/write head, the first monitor head being angularly disposed between the first read/write head and the second read/write head, the first monitor head and the first read/write head being positioned relative to one another such that the first monitor head scans a lateral portion of the width of each record track created by the first read/write head, the lateral portion being less than the reduced width of the record track after overlapping by an adjacent record track; and



e) a second monitor head mounted on the rotary drum for monitoring the data written on the magnetic tape by the second read/write head, the second monitor head being angularly disposed between the first read/write head and the second read/write head, the second monitor head and the second read/write head being positioned relative to one another such that the second monitor head scans a lateral portion of the width of each record track created by the second read/write head, the lateral portion being less than the reduced width of the record track after overlapping by an adjacent record track;

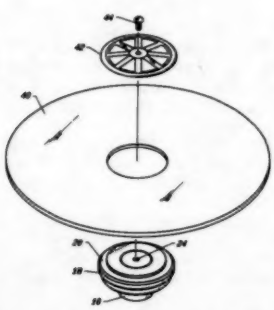
f) whereby the output signals of the first and second monitoring heads are less in amplitude than if they scanned the complete widths of the record tracks.

5,181,148

SPINDLE MOTOR FOR REDUCED SIZE DISK DRIVE AND METHOD OF MAKING SAME

Gregory J. Blanchette, Palo Alto, and Paul E. Jessee, San Jose, both of Calif., assignors to Conner Peripherals, Inc., San Jose, Calif.

Filed Jun. 28, 1990, Ser. No. 546,182
Int. Cl.[5] G11B *17/02*
U.S. Cl. 360—99.080 **9 Claims**



1. In a spindle motor for a disk drive having a stationary coil assembly and housing, the housing having a support flange for mounting on a disk drive base plate and a rotor driven by said coil assembly and having a disk mounting surface, a method of machining said disk mounting surface to a desired tolerance comprising the steps of

providing a rigid mounting fixture having a cavity for receiving said housing and a support surface for receiving said support flange,

mounting said housing in said cavity with said support flange engaging said support surface,

spinning said rotor of said spindle motor, and

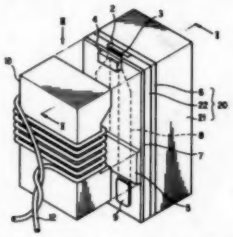
translating a cutting tool across the disk mounting surface to machine said disk mounting surface.

5,181,149

MAGNETIC RECORDING/REPRODUCING HEAD ASSEMBLY

Masao Katsumata, Odawara; Kazuhiro Momata, Chigasaki; Kazuyoshi Adachi, Kanagawa; Tooru Takeura, Odawara; Masahiro Kitada, Tokyo; Yoshihisa Kamo, Tokyo, and Toshikane Yoshimatsu, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 18, 1989, Ser. No. 408,690
Claims priority, application Japan, Sep. 19, 1988, 63-232310; Aug. 10, 1989, 1-207717
Int. Cl.[5] G11B *5/127, 5/30*
U.S. Cl. 360—119 **18 Claims**



1. A magnetic recording/reproducing head assembly comprising:

a first magnetic path forming member;

a second magnetic path forming member which forms a magnetic path in cooperation with the first magnetic path forming member;

a film laminate disposed between the first magnetic path forming member and the second magnetic path forming member at least at a side of the head assembly to be disposed adjacent to a recording medium during a recording-/reproducing operation;

said film laminate including a magnetic detecting element for detecting a change in a magnetic field and at least one soft magnetic film; and

a coil wound around the first magnetic path forming member for at least enabling excitation of the at least one soft magnetic film during a recording operation.

5,181,150

DUAL MAGNETIC HEAD FOR READING AND WRITING INFORMATION AT HIGH AND LOW TRACK DENSITY INCLUDING ERASE GAPS HAVING AN UNDULATING SHAPE

Yuichi Hayakawa; Takeshige Iwakura; Hiroshi Tsutsui, all of Tokyo; Atsushi Hirano, and Makoto Miyazaki, both of Gunma, all of Japan, assignors to NEC Corp., Tokyo, Japan

Filed Mar. 29, 1991, Ser. No. 677,196
Claims priority, application Japan, Mar. 29, 1990, 2-82792; Mar. 29, 1990, 2-82793
Int. Cl.[5] G11B *5/265, 5/10*
U.S. Cl. 360—121 **21 Claims**

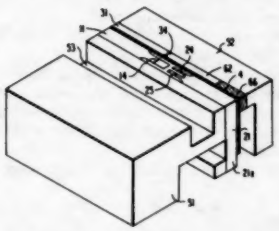
1. A dual magnetic head comprising:

a first read/write core including a first read/write gap having a first gap width, and extending in a first direction

which is a direction in which tracks to be formed on a magnetic recording medium extend;

a second read/write core including a second read/write gap having a second gap width greater than said first gap width, and juxtaposed to said first read/write core in a second direction substantially perpendicular to said first direction;

magnetic shield means provided between said first read/write core and said second read/write core; and



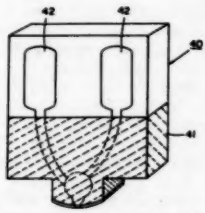
an erase core having a pair of erase gaps located at opposite ends of said second read/write gap with respect to said second direction, said erase core being juxtaposed to said first read/write core in said second direction and juxtaposed to said second read/write core in said first direction, at least one of facing surfaces of said erase core, which define said erase gaps therebetween, being provided with an undulating shape, wherein said first read/write core has a length less than a total length of said second read/write core and said erase core, as measured in said first direction.

5,181,151

THIN-FILM PERPENDICULAR MAGNETIC RECORDING AND REPRODUCING HEAD HAVING THIN MAGNETIC SHIELD FILM ON SIDE SURFACES

Masami Yamashita, Kawasaki; Noboru Iwato, Zama; Hideki Mine, Amagasaki, and Wada Toshiaki, Takatsuki, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka and Denki Kagaku Dogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Apr. 16, 1991, Ser. No. 685,652
Claims priority, application Japan, Apr. 19, 1990, 2-103922
Int. Cl.[5] G11B *5/147*
U.S. Cl. 360—126 **19 Claims**



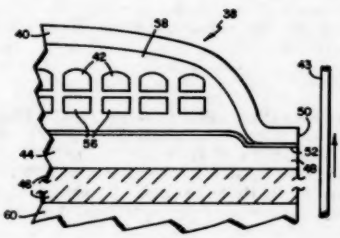
1. In a thin-film perpendicular magnetic recording and reproducing head which includes a magnetic member that defines a return path and defines a principal surface having a groove therein and sidewall surfaces, a nonmagnetic material in said groove, and a multilayer film assembly formed above said non-magnetic material when said principal surface is vertically oriented, said multilayer film assembly comprising in sequence a thin-film conductor coil, an interlayer insulating film, a main pole film, and a protective film, said magnetic member being in contact with said main pole film by a via hole, said main pole film extending to said principal surface of said magnetic member, which defines a sliding surface of said head intended to face a magnetic recording medium, the improvement wherein a thin magnetic shield film is connected to said sidewall surfaces of said magnetic member and to said protective film near said principal surface yet spaced from said principal surface by terminal areas.

5,181,152

LEADING EDGE UNDERSHOOT ELIMINATION IN THIN FILM HEADS

Ying D. Yan, Burnsville; John Bortins, Bloomington; Beat G. Keel, Prior Lake, and Nurul Amin, Burnsville, all of Minn., assignors to Seagate Technology Inc., Scotts Valley, Calif.

Filed Feb. 22, 1991, Ser. No. 660,410
Int. Cl.[5] G11B *5/147*
U.S. Cl. 360—126 **14 Claims**



1. A thin film magnetic head comprising:

a non-magnetic substrate;

a magnetic layer deposited on the non-magnetic substrate, the magnetic layer having a width;

a bottom pole piece deposited upon the magnetic layer and having a bottom pole tip, the bottom pole tip having a width which is substantially less than the width of the magnetic layer;

a top pole piece over the bottom pole piece and having a top pole tip, the top and bottom pole pieces defining a high permeability magnetic flux path and a magnetic flux gap between the top pole tip and the bottom pole tip; and

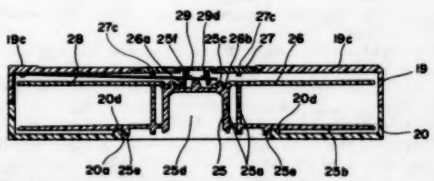
a plurality of conductors between the top pole piece and the bottom pole piece.

5,181,153

MAGNETIC TAPE CASSETTE WITH NOVEL TAPE REEL MOVEMENT LIMITING MEANS

Akihiro Nishimura, Higashi-Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 21, 1991, Ser. No. 657,787
Claims priority, application Japan, Feb. 21, 1990, 2-39946
Int. Cl.[5] G11B *23/08*
U.S. Cl. 360—132 **18 Claims**



1. A tape cassette comprising:

a cassette shell housing having a through hole therein;

a reel means rotatably mounted in said housing for rotation around a reel axis and made of a synthetic resin and adapted to have a magnetic tape wound thereon, and

displaceable in said housing in the direction of said reel axis;

a flat plate-like metallic plate spring having a base end fixed to an inner face of said housing and a free end directly engaging and urging an upper surface of said reel means in the direction of said reel axis toward a wall of said housing on the opposite side of said housing from said through hole; and

a reel displacing amount reducing means having an engaging portion within said housing engaging said plate spring and an exposed portion extending through said through hole, said reel displacing amount reducing means being movable in said through hole in the direction of said reel axis between a projected position in which said exposed portion projects outside said housing and a retracted position in which said exposed portion is within said through hole, and said engaging portion urges said plate spring against said reel means in resilient engagement therewith to urge said reel means against the wall of said housing on the opposite side of said housing from said through hole for holding said reel means against movement within said housing.

5,181,154

CIRCUIT ARRANGEMENT FOR OPTIMAL CURRENT GENERATION IN PROCESSES OF ELECTROCHEMICALLY INITIATED PLASMA-CHEMICAL LAYER PRODUCTION

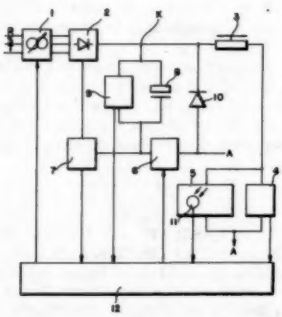
Jens Haupt; Kirstin Haupt, and Henry Hornhauer, all of Jena, Fed. Rep. of Germany, assignors to Jenoptik GmbH, Jena, Fed. Rep. of Germany

Filed Apr. 1, 1992, Ser. No. 861,913

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1991, 9104200[U]

Int. Cl.[5] H01G *1/10*; C25D *17/00*

U.S. Cl. 361—17 **2 Claims**



1. Circuit arrangement for the current supply in processes of electrochemically initiated plasma-chemical layer production comprising:

a controllable direct voltage source;

a bath for the process implementation and respective control electronics;

an adjustable three-phase transformer with a subsequently connected 6-pulse rectifier circuit being employed as a controllable direct voltage source, wherein the adjustable three-phase transformer carries a control input and the 6-pulse rectifier circuit carries a control output on the current source side and an output on the current sink side;

said output of the 6-pulse rectifier circuit on the current source side contacting the output of the 6-pulse rectifier circuit on the current sink side by way of a current limiting choke, by way of said bath for process implementation connected in parallel with a pulse analyzer, by way of a switch element and by way of a current sensor;

said output of the 6-pulse rectifier circuit on the current source side being branched twice as a bridge circuit with its output on the current sink side;

wherein the first bridge circuit, comprising a parallel connected capacitor with a voltage sensor, contacts the output of the 6-pulse rectifier circuit on the current source side between the switch element and the current sensor via a junction; and

wherein the second bridge circuit, which contains a free-wheeling diode, contacts the input of the current limiting choke after said junction and between the switch element and parallel connection of the pulse analyzer with the bath for process implementation;

an optoelectronic sensor being assigned to the bath for the process implementation;

an additional output of the pulse analyzer, the optoelectronic sensor, the voltage sensor and the current sensor, respectively, contacting inputs of the control electronics;

control electronics being assigned to the adjustable three-phase transformer; and

an output of the control electronics contacting the switch element.

5,181,155

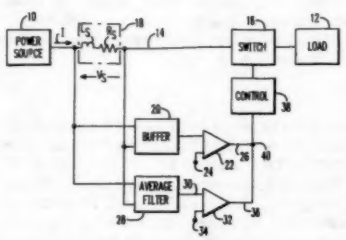
OVERCURRENT TRIP CIRCUIT

Mirza A. Beg, 2300 Kimberly Dr., #24, Lima, Ohio 45805, and David A. Fox, 3810 Emma Pkwy., Lima, Ohio 45806

Filed Aug. 30, 1990, Ser. No. 574,980

Int. Cl.[5] H02H *3/00, 7/00, 9/02*

U.S. Cl. 361—94 **7 Claims**



1. An overcurrent trip circuit comprising:

means for producing a status signal representative of current and rate of rise of the current in a power conductor, said means for producing a status signal including a shunt sensor inline with said power conductor, said shunt sensor having a resistive component for use in producing that portion of said status signal that is representative of said current in said power conductor and further having an inductive component for use in producing that portion of said status signal that is representative of said rate of rise of the current in said power conductor;

means for comparing said status signal to a first reference signal representative of a first preselected limit value for the rate of rise of current in said power conductor, and for producing a first trip signal when the magnitude of said status signal exceeds the magnitude of said first reference signal;

means for processing said status signal to produce a processed status signal, said processed status signal representative of an average value of the current through said power conductor;

means for comparing said processed status signal to a second reference signal and for producing a second trip signal when the magnitude of said processed status signal exceeds the magnitude of said second reference signal; and

means for opening a circuit in response to said first or second trip signals.

7. A method for opening a circuit in the event of an overcurrent condition, said method comprising the steps of:

monitoring average current and rate of rise of in a power

conductor by connecting a shunt sensor in-line with said power conductor, said shunt sensor having a resistive component for use in producing a first signal that is representative of said average current in said power conductor and further having an inductive component for use in producing a second signal that is representative of said rate of rise of the current in said power conductor; and

opening a circuit containing said power conductor when either the rate of rise of the current exceeds a first preselected limit value or the magnitude of the average current exceeds a second preselected limit value.

5,181,156

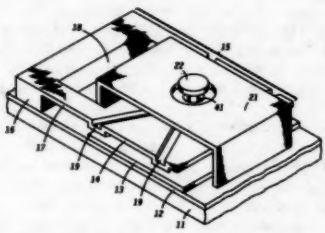
MICROMACHINED CAPACITOR STRUCTURE AND METHOD FOR MAKING

Ronald J. Gutteridge, and Ljubisa Ristic, both of Paradise Valley, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed May 14, 1992, Ser. No. 883,324

Int. Cl.[5] H01G *7/00*; G01P *15/08*

U.S. Cl. 361—283 **18 Claims**



10. A micromachined capacitor structure having a travel limit stop, the structure comprising: a substrate; a moving capacitor plate having an active area separated from the substrate by a first spacing and mechanically attached to the substrate by at least one anchor region, wherein the active region is substantially parallel to the substrate; and a corrugation formed in the second capacitor plate, wherein the corrugation has a bottom surface located over the substrate and separated from the substrate by a second spacing, wherein the second spacing is smaller than the first spacing.

5,181,157

CERAMIC CAPACITOR AND METHOD FOR FABRICATING THE SAME

Hirokazu Chazono; Mutsumi Honda; Hiroi Kisi; Hirosi Saito, and Hisamitsu Shizuno, all of Tokyo, Japan, assignors to Taiyo Yuden Kabusikigaisha, Japan

PCT No. PCT/JP91/00396, § 371 Date Oct. 17, 1991, § 102(e) Date Oct. 17, 1991, PCT Pub. No. WO91/15023, PCT Pub. Date Oct. 3, 1991

PCT Filed Mar. 28, 1991, Ser. No. 773,645

Claims priority, application Japan, Mar. 28, 1990, 2-76765; Mar. 28, 1990, 2-76766

Int. Cl.[5] H01G *4/10, 7/00*

U.S. Cl. 361—321 **4 Claims**

1. A ceramic capacitor, comprising:

at least one dielectric ceramic layer of a dieletric ceramic composition and at least two internal electrodes sandwiching said dielectric ceramic composition;

said dielectric ceramic composition comprising a fired mixture of a basic component of 100 weight portions and an additional component in the range of 0.2 to 5 weight portions;

said basic component comprising a material represent by the following formula:

$$(Ba_{k-(x+y)}M_xL_y)O_k(Ti_{1-z}R_z)O_{2-z/2}$$

where M is Mg and/or Zn, L is Ca and/or Sr, R is one or more metal elements selected from the group consisting of Sc, Y, Gd, Dy, Ho, Er and Yb; and k, x, y and z are numerals fulfilling the following conditions:

$1.00 \leqq k \leqq 1.05$

$0 < x < 0.10$

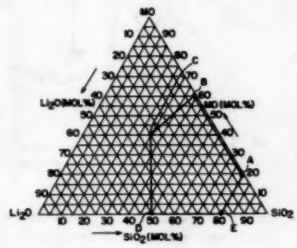
$0 < y \leqq 0.05$

$0.01 \leqq x+y \leqq 0.10$

$0.002 \leqq z \leqq 0.06$;

said additional component comprising Li_2O, SiO_2 and MO (wherein said MO is at least one metal oxide selected from the group consisting of BaO, SrO, CaO, MgO and ZnO); and

a ratio among amounts of Li_2O, SiO_2 and MO in said additional component is within an area in a ternary system diagram of mol % having five vertexes of first to fifth vertexes, wherein:



said first vertex A represents a condition in which amounts of Li_2O is 1 mol %, SiO_2 is 80 mol % and MO is 19 mol %;

said second vertex B represents a condition in which amounts of Li_2O is 1 mol %, SiO_2 is 39 mol % and MO is 60 mol %;

said third vertex C represents a condition in which amounts of Li_2O is 30 mol %, SiO_2 is 30 mol % and MO is 40 mol %;

said fourth vertex D represents a condition in which amounts of Li_2O is 50 mol %, SiO_2 is 50 mol % and MO is 0 mol %; and

said fifth vertex E represents a condition in which amounts of Li_2O is 20 mol %, SiO_2 is 80 mol % and MO is 0 mol %.

5,181,158

PHASE BARIER FOR PADMOUNTED SWITCHGEAR

Melvin B. Goe, Jr., and Carl W. Yager, both of Centralia, Mo., assignors to A. B. Chance, Centralia, Mo.

Filed Dec. 11, 1991, Ser. No. 805,023

Int. Cl.[5] H02B *5/00*

U.S. Cl. 361—335 **9 Claims**

1. A multiple-phase electrical distribution apparatus comprising:

an enclosure having an access opening and defining an interior space;

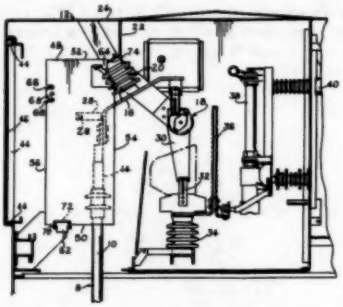
at least two electrical transmission components for controlling separate phases of electricity within the apparatus, the components being disposed within the enclosure and being spaced laterally from one another;

a barrier panel formed of a dielectric material and sized to provide a barrier between the components when positioned within the enclosure, the barrier panel including opposed surfaces, a lower edge, and an upper edge opposite the lower edge; and

support means within the enclosure for permitting the barrier panel to be manually placed in a working position within the enclosure and to be manually lifted from the working position, and for supporting the barrier panel

when in the working position, the support means including

a mounting bracket connected to the enclosure and extending horizontally in a direction parallel to the direction in which the components are spaced, the bracket including a transverse slot disposed between the electrical transmission components and defining a pair of bearing surfaces which grip the opposed surfaces of the barrier panel when the lower edge of the panel is inserted in the slot,



means on the barrier panel for preventing the barrier panel from sliding within the slot in a direction transverse to the direction in which the mounting bracket extends, and

structure defining a recess in the enclosure located above the transverse slot in the mounting bracket, the barrier panel engaging the recess to stabilize the barrier panel against lateral movement while the barrier panel is supported within the slot of the mounting bracket.

5,181,159

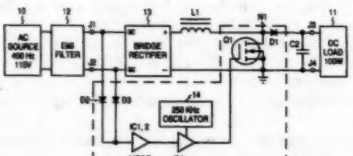
AC TO DC CONVERTER HAVING AN ENHANCED POWER FACTOR

William A. Peterson, Vestal; Michael S. Elmore, and Steven D. Sherwood, both of Endicott, all of N.Y., assignors to General Electric Company, Johnson City, N.Y.

Continuation of Ser. No. 632,867, Dec. 24, 1990. This application Mar. 11, 1992, Ser. No. 855,111

Int. Cl.[5] H02M *7/217*; G05F *1/70, 1/613*

U.S. Cl. 363—89 **7 Claims**



1. An AC to DC converter having an enhanced power factor comprising

A) a first and a second converter input terminal for connection to a source of AC electrical energy at a first frequency;

B) a positive and a negative converter DC output terminal for connection to a load;

C) a full wave rectifier coupled to said first and said second converter input terminals for converting AC electrical energy to DC, said rectifier having positive and negative output terminals, said negative rectifier output terminal being connected to said negative converter output terminal;

D) an inductor connected between said positive rectifier output terminal and a first node;

E) a solid state switch having a control electrode, and two principal electrodes one of which is connected to said negative converter output terminal and the other of which is connected to said first node;

F) a diode having its anode connected to said first node and its cathode to said positive converter output terminal;

G) an energy storage capacitor connected between said positive and negative converter output terminals;

said converter under load, when said transistor is quiescent, drawing energy primarily from said AC source during the middle portion, about the peak of each half cycle of the instantaneous AC voltage waveform of said source of AC electrical energy,

H) voltage sensing means coupled between said input terminals for sensing when the magnitude of the voltage of the instantaneous AC voltage waveform of said source of AC electrical energy is less than a threshold value above zero on the rising and falling portion of each half cycle, and

I) means responsive to said voltage sensing means coupled to said gate electrode for operating said solid state switch at a high frequency rate in relation to said first frequency during the beginning and ending of each half cycle of the instantaneous AC waveform that are below said threshold;

said inductor, solid state switch, diode and capacitor forming a boost converter, operating at said high frequency rate at the beginning and ending of each half cycle to increase the instantaneous energy drawn from said AC source in order to increase the withdrawal of energy throughout each cycle and enhance the power factor.

5,181,160

DRIVING CIRCUIT FOR INVERTER MICROWAVE OVEN

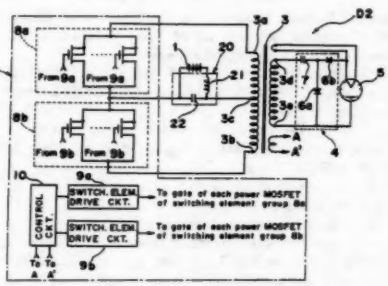
Mitsuo Okamoto, Yamatotakada; Hirokazu Kodama, Kashihara, and Kouji Minamino, Fujiidera, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 19, 1991, Ser. No. 733,197

Claims priority, application Japan, Jul. 26, 1990, 2-200688; May 24, 1991, 3-120160

Int. Cl.[5] H02M *3/337*; H05B *6/64*

U.S. Cl. 363—97 **4 Claims**



1. A driving circuit for an inverter microwave oven comprising:

a push-pull voltage type inverter circuit including,

two sets of switching element groups each having at least two switching elements connected in parallel to each other for switching D.C. current supplied from a D.C. power source, and

control means arranged to set a period for simultaneously turning off said two sets of switching element groups

and to alternately turn on said switching element groups by the same duty cycle;

a set-up transformer supplied, at its primary winding having a center tap, with A.C. current from said push-pull voltage type inverter circuit; and

a voltage doubler rectifier circuit connected to a secondary winding of said set-up transformer for supplying electric power to a magnetron through a first capacitor;

the driving circuit being set so that one half period of a waveform of current flowing through said switching elements becomes equal to said duty cycle by adjusting a leakage inductance of said step-up transformer, a capacitance value of said first capacitor and a circuit resistance of said voltage doubler rectifier circuit or by adjusting said duty cycle of for alternately turning on said switching element groups.

5,181,161

SIGNAL REPRODUCING APPARATUS FOR OPTICAL RECORDING AND REPRODUCING EQUIPMENT WITH COMPENSATION OF CROSSTALK FROM NEARBY TRACKS AND METHOD FOR THE SAME

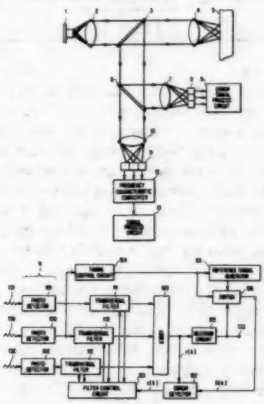
Yutaka Hirose; Yutaka Yamanaka, and Kazuhiro Okanoue, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 23, 1990, Ser. No. 513,451

Claims priority, application Japan, Apr. 21, 1989, 1-100112; Jul. 6, 1989, 1-176514

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—48 **8 Claims**



1. A signal reproducing apparatus for use in combination with an optical source for emitting a plurality of light beams directed to a desired track and neighboring tracks on a recording medium and a photodetector means for receiving reflections of said light beams from said desired and neighboring tracks on said recording medium and for producing first and second signals, said desired track being between said neighboring tracks, said desired track storing information to be reproduced, said first signal being delivered from said desired track, said second signals being delivered from said neighboring tracks, said signal reproducing apparatus comprising:

a plurality of filtering means respectively receiving said first and second signals for varying frequency characteristics of said first and second signals to produce first and second characteristic-converted signals;

signal adding means for adding said first characteristic-converted signal and said second characteristic-converted signals to deliver a reproduced signal; and

characteristic control means for controlling a frequency characteristic of a said plurality of filtering means in accordance with said reproduced signal.

5,181,162

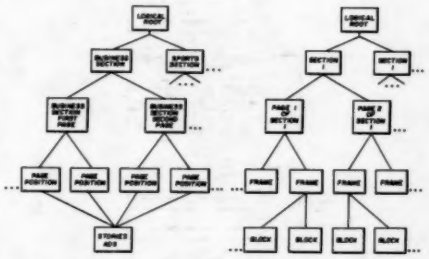
DOCUMENT MANAGEMENT AND PRODUCTION SYSTEM

Robert M. Smith, Andover; David M. T. Ting, Sudbury; Jan H. Boer, Lexington, and Marvin Mendelssohn, Melrose, all of Mass., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 6, 1989, Ser. No. 446,937

Int. Cl.[5] G06F *1/00, 15/20*

U.S. Cl. 364—419 **20 Claims**



1. A document management and production system for accepting and organizing document information, the system comprising:

a. electronic data-storage means comprising a plurality of data locations;

b. means for storing in said data locations, for each document, information representative of document components that collectively specify content, organization and appearance of the document, said information including:

1) logical document components defining structural divisions and structural relationships among information-bearing constituents of the document;

2) attributes, if any, of such logical document components;

3) layout document components that define how content is physically distributed and located within the document; and

4) attributes, if any, of such layout document components;

c. database-management means for specifying ordinal and hierarchical relationships among logical document components and among layout document components; and

d. document-management means for integrating the logical and layout components into a single, organized document;

wherein at least some of the attributes associated with the logical document components contain information specifying locational preferences and positions of such components within the document, thereby facilitating mapping of logical document components that specify information-bearing constituents to layout document components to produce an integrated document.

5,181,163

METHOD AND APPARATUS FOR GENERATING AND/OR UPDATING COOCCURRENCE RELATION DICTIONARY

Hiroyuki Nakajima, Kyoto, and Hiroyuki Kaji, Tama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 31, 1989, Ser. No. 387,598

Claims priority, application Japan, Aug. 3, 1988, 63-192751

Int. Cl.[5] G06F *15/38*

U.S. Cl. 364—419 **12 Claims**

1. A method of generating and updating a cooccurrence relation directory in a natural language processing system including an input/output device, a memory for storing therein

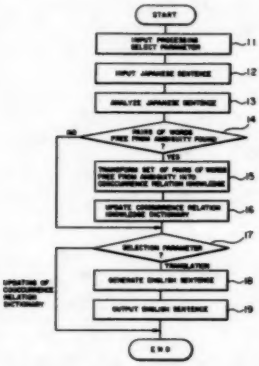
dictionary information, and a processor for processing an input sentence by use of the dictionary information, the method comprising the steps of:

effecting a syntactic analysis on the input sentence, wherein said syntactic analysis is effected such that all possible syntactic structures are produced, each structure being expressed as a set of predicate-argument relationships;

inspecting ambiguity in predicate-argument relationships included in said input sentence, wherein said ambiguity inspection is effected such that a predicate-argument relationship which occurs in said all possible syntactic structures produced by the syntactic analysis is judged to be unambiguous;

transforming unambiguous predicate-argument relationships obtained as a result of said inspecting into information having a predetermined format; and

registering said transformed unambiguous predicate-argument relationships to said cooccurrence relation dictionary.

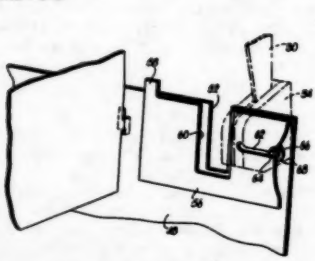


5,181,164

COMPARTMENT BARRIER FOR PADMOUNTED SWITCHGEAR

Lloyd R. Beard, and Melvin B. Goe, Jr., both of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Dec. 11, 1991, Ser. No. 804,970
Int. Cl.[5] H02B 1/14
U.S. Cl. 361—345 **9 Claims**



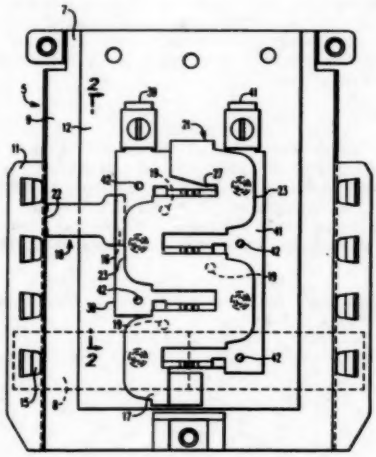
7. An electrical distribution apparatus as recited in claim **1**, wherein the movable element is a blade, the apparatus further comprising mounting means for mounting the blade for pivotal movement about a substantially horizontal axes.

5,181,165

PANELBOARD WITH INSULATIVE SNAP-IN SUPPORT MEANS

Donald F. Gehrs, Brandon, and Louis L. Runge, Clinton, both of Miss., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 24, 1991, Ser. No. 782,188
Int. Cl.[5] H02B 1/20
U.S. Cl. 361—355 **10 Claims**

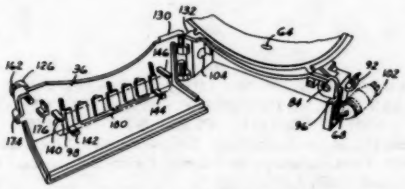


1. An improved panel interior assembly of the type comprising a pan, an elongated insulating support structure mounted on the pan and a pair of elongated bus bars, each bus bar comprising an elongated body portion and a plurality of stabs extending from the body portion in a longitudinally spaced relationship, the body portion having opening means therein, the insulating support structure comprising a body portion having a plurality of longitudinally spaced ledge parts at each of two opposite sides thereof, a plurality of transversely extending longitudinally spaced fingers extending from each side of the body portion of the insulating support structure, at each of said two opposite sides of said insulating support structure all adjacent spaced ledges being spaced by a stab-receiving slot, said ledge parts and said stab-receiving slots of said two opposite sides being staggered lengthwise such that each stab-receiving slot at each side of said insulating support structure is opposite a ledge part of the opposite side of said insulating support structure, said pair of bus bars being supported on said opposite sides of said insulating support structure with the spaced stabs of each bus bar being positioned in the associated slots and with the spaced ledge parts of the associated side being positioned over parts of the associated bus bars, said stabs of said pair of bus bars being positioned in an interleaved relationship aligned lengthwise along said insulating support structure, each of said bus bars being supported by the ledge parts and resting on the associated fingers and projection means on top of said ledge parts cooperating with the opening means on said body portions of said bus bars to retain said bus bars in the mounted position on said insulating support structure wherein the improvement comprises a plurality of integrally molded pins attached to said insulating support structure extending through holes in a pan to which the insulating support structure is attached and an ultrasonically staked head formed on at least one pin after the pin has been inserted into a hole.

5,181,166
SECURING MECHANISM FOR AN ELECTRICITY METERING DEVICE

Chesley R. Howell, Scarborough, Canada, assignor to Schlumberger Canada Limited, Toronto, Canada

Filed May 31, 1991, Ser. No. 708,754
Int. Cl.[5] H02B *9/00*
U.S. Cl. 361—364 **9 Claims**



1. A securing mechanism for an electricity metering device including a housing having a cavity, the securing mechanism comprising:

a cover connected to the housing with hinge means;

a first opening on the cover;

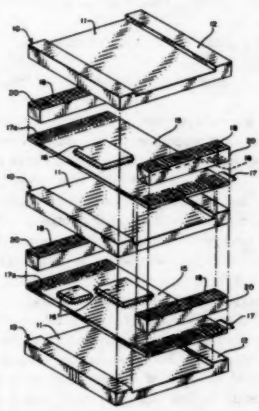
a lug on the cover adjacent the first opening, the lug defining a second opening; and

a sealing screw including a head having a cross-drilled hole, whereby the sealing screw is inserted into the first opening in the cover, screwed into the housing, and rotated until the cover is secured over the housing and the cross-drilled hole is aligned with the second opening on the lug, whereby a sealing wire is passed through the second opening and the cross-drilled hole in the sealing screw.

5,181,167
STACKING HEATPIPE FOR THREE DIMENSIONAL ELECTRONIC PACKAGING

Howard L. Davidson, San Carlos, and Satyanarayana Nishtala, Santa Clara, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Dec. 2, 1991, Ser. No. 801,672
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—385 **17 Claims**



1. In a compact electronic system having a plurality of electronic circuit modules including a multiplicity of electronic circuit elements, a cooling apparatus comprising:

a plurality of self contained substantially isothermal heatpipes;

each heatpipe integrally receiving at least one of said electronic circuit modules, said heatpipes and electronic circuit modules when integrated forming a plurality of heatpipe/electronic modules;

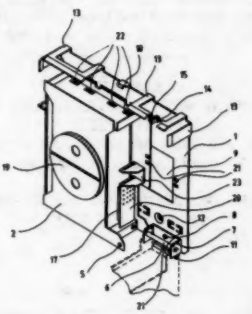
connector means coupled to said electronic circuit modules for electrically interconnecting said electronic circuit modules; and,

framework means connected to said plurality of heatpipe/electronic modules for maintaining said heatpipe/electronic modules in mechanical and electrical contact, said framework means allowing said heatpipe/electronic modules to be successively stacked wherein each of said heatpipe/electronic modules vertically touches an adjacent heatpipe/electronic module to form said compact electronic system.

5,181,168
ACCOMMODATION DEVICE FOR ASSEMBLY UNITS

Reinhold Seitz, Heroldsberg, and Hans-Jürgen Weidner, Winkelhaid, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1990, Ser. No. 510,908
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1989, 3913923
Int. Cl.[5] H02B *1/01*
U.S. Cl. 361—427 **6 Claims**



1. A combination for facilitating the assemblage of signal processing equipment including a base plate with a substantially flat surface and which is designed to be secured to a wall, a first assembly unit having a longitudinal dimension; first connecting means for attaching the first assembly unit to the substantially flat surface of said base plate with said longitudinal dimension aligned parallel to said substantially flat surface second connecting means for attaching the first assembly unit to the substantially flat surface of the base plate with the longitudinal dimension perpendicular thereto and further comprising a second assembly unit substantially the same structurally as said first assembly unit also having a longitudinal dimension, said second assembly unit being connected to said substantially flat surface of said base plate with its longitudinal dimension being aligned perpendicularly to said flat surface of said base plate.

5,181,169
BI-DIRECTIONAL PWM CONVERTER

Muthu K. Murugan, Howell, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

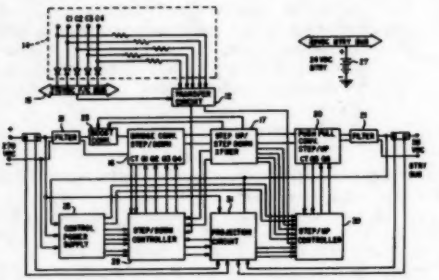
Filed Nov. 15, 1991, Ser. No. 793,045
The portion of the term of this patent subsequent to Aug. 18, 2009, has been disclaimed.
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—17 **16 Claims**

1. A bi-directional power converter comprising:

input power means for receiving input power;

circuitry means connected to said input power means capable of providing power conversion between 270 volts to 28 volts and power conversion between 28 volts to 270 volts;

said circuitry means including bridge converter means, transformer means connected to said bridge converter



means, push pull converter means connected to said transformer means, boost converter means connected to said input power means, said bridge converter means and said transformer means, and filter means connected to said push pull converter means and connected between said input power means and said boost converter means; and

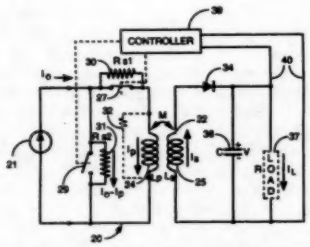
output means for providing power conversion output.

5,181,170

HIGH EFFICIENCY DC/DC CURRENT SOURCE CONVERTER

Xianrui Huang, and Yehia M. Eyssa, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Dec. 26, 1991, Ser. No. 816,381
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—21 **21 Claims**



1. A converter accepting DC current from a DC current source to supply power to a load, comprising:

(a) a transformer having a highly coupled primary and secondary;

(b) a first controllable switch connected in series with the primary;

(c) a second controllable switch connected in parallel with the series combination of the first switch and the primary and connectable to the current source to bypass the current from the current source therethrough when the second switch is closed;

(d) resistance connected in parallel with the first and second switches;

(e) rectifying means connected to the secondary for rectifying the output of the secondary to provide unidirectional output current;

(f) an energy storage device connected across the output of the rectifying means and connectable in parallel with the load, the energy storage device being chargeable by the current from the rectifying means to maintain a voltage therefrom; and

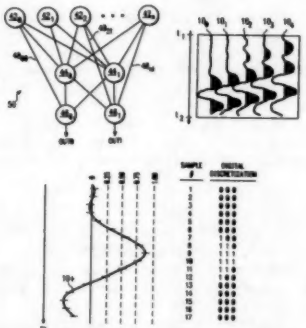
(g) control means for controlling the switching of the first and second switches to alternately open and close to charge the energy storage device and maintain a voltage thereacross.

5,181,171

ADAPTIVE NETWORK FOR AUTOMATED FIRST BREAK PICKING OF SEISMIC REFRACTION EVENTS AND METHOD OF OPERATING THE SAME

Michael D. McCormack, Plano, Tex., and Alan D. Rock, Knoxville, Tenn., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 20, 1990, Ser. No. 585,967
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—421 **10 Claims**



1. A method for operating an adaptive network to determine a first break in recorded seismic data comprising:

operating a seismic source to generate seismic vibrations;

detecting said seismic vibrations at a plurality of surface locations;

recording the detected seismic vibrations as a plurality of traces;

storing data representing said plurality of traces in a memory;

retrieving a selected portion of said stored data representing a first trace corresponding to vibrations detected at a first surface location, and in which a first break occurs, and a plurality of neighboring traces corresponding to vibrations detected at a plurality of surface locations near said first surface location and in substantially the same direction from said seismic source as said first surface location, over a period of time including an analysis time;

presenting said retrieved selected portion of said stored data to input nodes of said adaptive network;

operating said adaptive network to produce an output indicating whether or not the analysis time corresponds to the time at which said first break occurs in said first trace;

responsive to the output of said adaptive network indicating that the analysis time does not correspond to the time at which said first break occurs in said first trace, adjusting said analysis time; and

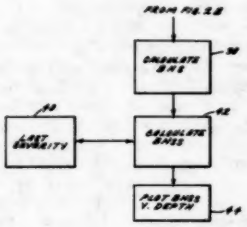
repeating said retrieving, presenting and operating steps for a portion of said stored data representing said first trace and said plurality of neighboring traces over a period of time including the adjusted analysis time.

5,181,172

METHOD FOR PREDICTING DRILLSTRING STICKING

Ronald G. Whitten, Berlin, Conn., assignor to Teleco Oilfield Services Inc., Meriden, Conn.

Filed Nov. 14, 1989, Ser. No. 436,237
Int. Cl.[5] G06F *15/20*; E21B *44/00*
U.S. Cl. 364—422 16 Claims



1. A method for predicting onset of drillstring sticking while drilling a borehole, comprising:

(1) drilling a borehole from a first measured bit depth D_1 to a second measured bit depth D_2;

(2) calculating a first borehole severity value, BHS_1 for the drillstring at the first measured bit depth D_1;

(3) calculating a second borehole severity value, BHS_2 for the drillstring at the second measured bit depth, D_2;

(4) calculating a first borehole severity slope value, $BHSS_1$ for the difference in borehole severity relative to the difference in measured bit depth between D_1 and D_2, where:

$$BHSS_1 = \frac{BHS_2 - BHS_1}{D_2 - D_1};$$

(5) comparing $BHSS_1$ to a reference borehole severity slope value, $BHSS_0$;

(6) predicting onset of drillstring sticking based on the magnitude of the difference between $BHSS_1$ and $BHSS_0$; and

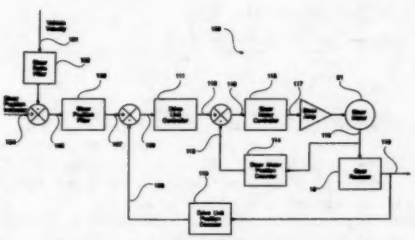
(7) taking remedial action to avoid sticking of the drillstring in the borehole, if the drillstring sticking is predicted from step (6).

5,181,173

VARIABLE RATIO STEERING SYSTEM FOR A MOTOR VEHICLE

Isaac Avitan, Vestal, N.Y., assignor to Raymond Corporation, Greene, N.Y.

Filed Jul. 23, 1991, Ser. No. 734,710
Int. Cl.[5] B62D *5/04*
U.S. Cl. 364—424.05 11 Claims



7. A variable steering ratio feedback control circuit for a material handling vehicle, comprising:

a steer motor for steering a material handling vehicle via a steer/drive wheel;

a steer ratio filter for generating a steer ratio signal in response to a change in velocity of said vehicle;

first summing means operatively connected to said steer ratio filter for summing a steering position reference signal with said steer ratio signal generated by said steer ratio filter to provide a first summed signal;

a position filter for receiving said first summed signal and in response thereto, generating a steering position signal;

first feedback control means operatively connected to said steer motor for providing a feedback position signal with respect to said steer motor;

second summing means operatively connected to said position filter and said first feedback control means for summing said steering position signal with said feedback position signal to provide a second summed signal;

drive unit controller operatively connected to said second summing means for generating a motor velocity signal to said steer motor for steering said material handling vehicle, in response to said second summed signal;

second feedback control means connected between said first feedback control means and said drive unit controller for generating a second feedback control signal; and

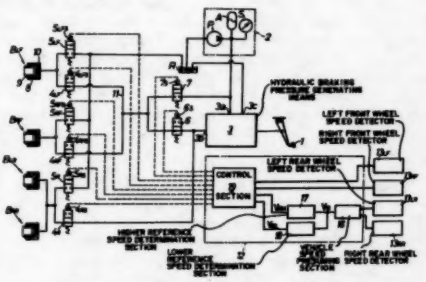
third summing means operatively connected between said drive unit controller and said second feedback control means for summing said second feedback control signal with said motor velocity signal for controlling rotation of said steer motor.

5,181,174

TRACTION CONTROL METHOD FOR VEHICLE

Shohei Matsuda, and Toshio Yahagi, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1990, Ser. No. 592,733
Claims priority, application Japan, Oct. 5, 1989, 1-260861
Int. Cl.[5] B60T *8/58*
U.S. Cl. 364—426.02 2 Claims



2. A traction control method for a vehicle, comprising the steps of:

comparing the amount of driven wheel speed (V_W) changed per unit time with a reference deceleration (V_{R-}) as well as a reference acceleration (ΔV_{R+}) whose absolute value is set larger than that of said reference deceleration (ΔV_{R-});

setting the vehicle speed (V_R) equal to the driven wheel speed (V_W), if the amount of said driven wheel speed (V_W) changed per unit time indicates a deceleration less than the reference deceleration (ΔV_{R-});

setting the vehicle speed (V_R) equal to the last determined vehicle speed ($V_{R(n-1)}$) corrected by a value based on the reference deceleration (ΔV_{R-}), if the amount of said driven wheel speed (V_W) changed per unit time indicates a deceleration greater than or equal to the reference deceleration (ΔV_{R-});

setting the vehicle speed (V_R) equal to the driven wheel speed (V_W), if the amount of said driven wheel speed (V_W) changed per unit time indicates an acceleration less than the reference acceleration (ΔV_{R+});

setting the vehicle speed (V_R) equal to the last determined vehicle speed ($V_{R(n-1)}$) corrected by said reference acceleration (ΔV_{R+}), if the amount of said driven wheel speed (V_W) changed per unit time indicates an acceleration greater than or equal to the reference acceleration (ΔV_{R+});

determining a slipping tendency of a driving wheel in a driving state by comparing a reference speed (V_{RH}, V_{RL}) obtained on the basis of said vehicle speed (V_R) with a driving wheel speed; and

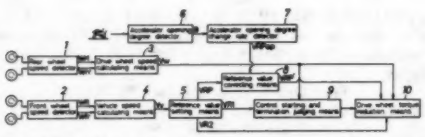
suppressing the driving torque in accordance with said determined slipping tendency of said driving wheel in the driving state.

5,181,175

DRIVE WHEEL SLIP CONTROL SYSTEM FOR VEHICLE

Shuji Shiraishi, and Osamu Yamamoto, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 611,573
Claims priority, application Japan, Nov. 13, 1989, 1-294475
Int. Cl.[5] B60K *31/00*
U.S. Cl. 364—426.03 **3 Claims**



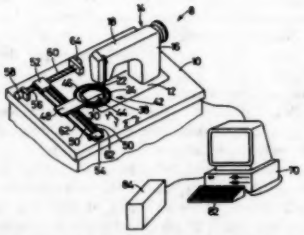
1. A drive wheel slip control system for a vehicle, comprising a reference value setting means for setting a reference value for slippage of a drive wheel providing an appropriate slipping condition, a drive wheel torque reduction means for reducing torque of said drive wheel when slippage of said drive wheel exceeds said reference value, an accelerator opening degree change rate detector for detecting a change rate of opening degree of an accelerator of a prime mover which drives said drive wheel and a reference value correcting means for correcting said reference value dependent on a signal outputted from said accelerator opening degree change rate detector.

5,181,176

EMBROIDERY DATA PREPARING APPARATUS

Atsuya Hayakawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 4, 1990, Ser. No. 592,983
Claims priority, application Japan, Oct. 13, 1989, 1-266547
Int. Cl.[5] G06F *15/46;* **D05B** *21/00*
U.S. Cl. 364—470 **20 Claims**



1. An apparatus for preparing stitch position-related data utilized y an embroidery sewing machine to embroider a predetermined area by forming stitches at respective stitch positions and thereby filling the area with the formed stitches, comprising:

direction determining means for determining a reference direction with respect to said area based on outline data representative of an outline of said area, said outline data including a plurality of sets of position data each of which is representative of a corresponding one of a plurality of specific positions predetermined on said outline;

block defining means for defining a plurality of straight first aid lines which are perpendicular to said reference direction and each of which passes a corresponding one of the specific positions located on a first portion of said outline and intersects a second portion of said outline different from said first portion, and thereby dividing said area and said outline into a plurality of first blocks and a plurality of first segments, respectively, each of said first blocks being enveloped by corresponding two of said first aid lines which are opposed to each other and corresponding two of said first segments which are opposed to each other;

block modifying means for modifying said first blocks by selecting, as a division base position, on of the specific positions located on said second portion of said outline which one specific position cooperates with each of the specific positions located on said first portion of said outline and associated with said first aid lines to define, in place of the first aid line passing said each associated specific positions, a division line which passes said each associated specific position on said first portion of said outline and said division base position on said second portion of said outline;

data producing means for producing as said control data stitch position-related data based on the modified blocks, said stitch position-related data relating to said stitch position where said stitches are formed to fill said area; and

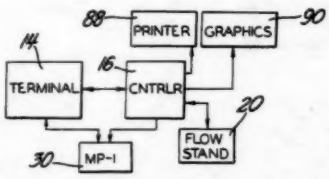
data utilization means for using the stitch position-related data to form the stitches.

5,181,177

METHOD AND APPARATUS FOR NON-CONTACT MACHINING WITH DYNAMIC FEEDBACK CONTROL

Robert D. Bond, Northville, and Thomas E. Denham, Plymouth, both of Mich., assignors to Raycon Corporation, Ann Arbor, Mich.

Continuation of Ser. No. 365,747, Jun. 13, 1989, abandoned.
This application Oct. 9, 1991, Ser. No. 773,240
Int. Cl.[5] B23H *1/02*
U.S. Cl. 364—474.04 **17 Claims**



1. A method of non-contact machining a workpiece to provide a plurality of features thereof with a specified combined size within predetermined tolerances, the machining being determined by plural parameters at least one of which is adjustable, the method comprising the steps of:

machining a workpiece to form a first feature, the feature having a size which varies with an adjustable parameter,

measuring the first feature on the workpiece to obtain a first measurement value which represents the size of the first feature,

machining a second feature by adjusting the adjustable pa-

rameter to machine the second feature to an extrapolated size determined from the first measurement value so that the combined size of the first and second features is within a predetermined tolerance.

5,181,178

SPINDLE CONTROL COMMAND METHOD

Takao Sasaki, Hachioji; Kentaro Fujibayashi, Musashino, and Masahiko Miyake, Minamitsuru, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

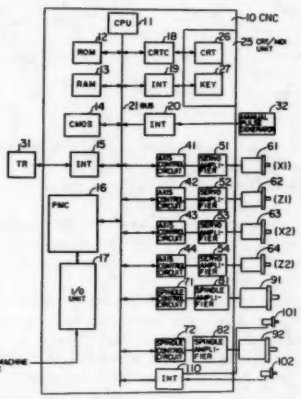
PCT No. PCT/JP90/00130, § 371 Date Oct. 1, 1990, § 102(e) Date Oct. 1, 1990, PCT Pub. No. WO90/10261, PCT Pub. Date Jul. 9, 1990

PCT Filed Feb. 1, 1990, Ser. No. 582,204

Claims priority, application Japan, Feb. 22, 1989, 1-42427

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—474.11 **1 Claim**



1. A spindle control command method for controlling a plurality of spindles using a single numerical control device (CNC) comprising the steps of:

(a) commanding synchronous control for a plurality of spindles by using a G code and designate-codes which designate a plurality of spindles controlled synchronously;

(b) commanding a start of spindle rotation by using an M-code;

(c) machining a first workpiece having a first length;

(d) cancelling the synchronous control for the plurality of spindles;

(e) commanding spindle speeds for the plurality of spindles, respectively; and

(f) machining a plurality of second workpieces based on respective spindle speeds, said second workpieces having lengths which are shorter than the first length.

5,181,179

ARTIFICIAL PARAMETER HOMOTOPY METHODS FOR THE DC OPERATING POINT PROBLEM

San-Chin Fang, New Providence; Robert C. Melville, Scotch Plains, and Ljiljana Trajkovi , Chatham, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 25, 1990, Ser. No. 557,874

Int. Cl.[5] G06F *15/72, 15/20*

U.S. Cl. 364—488 **21 Claims**

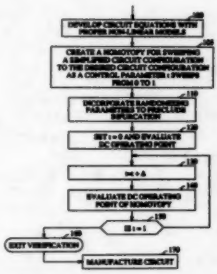
1. A method for determining the dc operating state of a circuit that has a specified configuration, comprising the steps of:

modifying said circuit to create a modified circuit configuration which,

1) in response to a control parameter having a first level, modifies the configuration of said circuit and injects a randomizing current into at least some nodes of the circuit, to allow for a simplified determination of a first dc operating state,

2) in response to said control parameter having a second level, restores said circuit to its specified configuration, to allow determination of said dc operating state of said circuit, and

3) in response to other levels of said control parameter,


DEVELOP CIRCUIT EQUATIONS WITH PROPER NON-LINEAR MODELS
CREATE A HOMOTOPY FOR SWEEPING A SIMPLIFIED CIRCUIT CONFIGURATION TO THE DESIRED CIRCUIT CONFIGURATION AS A CONTROL PARAMETER : SWEEPS FROM 0 TO 1
INCORPORATE RANDOMIZED PARAMETERS TO PERCLUDE BIFURCATION
SET t = 0 AND EVALUATE DC OPERATING POINT
t = t + Δ
EVALUATE DC OPERATING POINT OF HOMOTOPY
t = 1
EXIT VERIFICATION
MANUFACTURE CIRCUIT

allows the determination of other dc operating states that, together, form a trajectory of dc operating states;

setting said control parameter to said first level and evaluating said first dc operating state;

determining a dc operating state of said modified circuit configuration, at the set level of said control parameter;

altering said control parameter in the direction of advancing along said trajectory; and

returning to said step of determining.

5,181,180

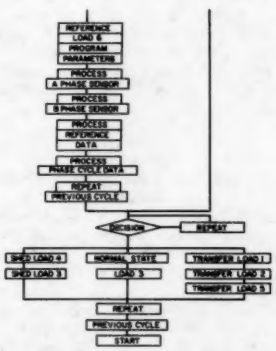
METHOD AND APPARATUS FOR MONITORING AND MAINTAINING AN OPTIMUM BALANCE BETWEEN THE MAIN PHASES OF A MULTI-PHASE MULTIPLE LOAD LOCAL ELECTRICAL DISTRIBUTION SYSTEM

William A. Munro, 8216 - 98 Ave., Edmonton, Alberta, Canada

Filed Aug. 16, 1990, Ser. No. 568,209

Int. Cl.[5] G06F *15/56*

U.S. Cl. 364—492 **6 Claims**



1. Apparatus for use with a local electrical distribution system having at least first and second loads, the first load drawing a first current and the second load drawing a second current, and in which local electrical distribution system at least first and second differentially phased currents are carried by at least first and second main phase conductors respectively, the apparatus comprising:

a plurality of first sensors for monitoring at least the first and

second currents and for producing first and second signals representative of the first and second currents;

a plurality of second sensors for monitoring at least the first and second differentially phased currents and for producing third and fourth signals representative of the first and second differentially phased currents;

control means responsive to at least the first, second, third and fourth signals for determining whether to transfer one of the loads from one conductor to another; and

at least first and second relays connected to and responsive to the controls means, the first and second relays being associated with the first and second loads respectively.

5,181,181

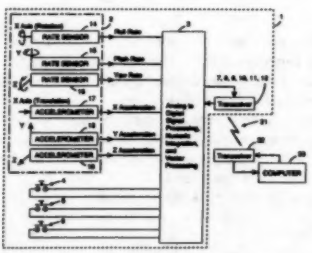
COMPUTER APPARATUS INPUT DEVICE FOR THREE-DIMENSIONAL INFORMATION

Brian J. Glynn, Merritt Island, Fla., assignor to Triton Technologies, Inc., Burke, Va.

Filed Sep. 27, 1990, Ser. No. 588,824

Int. Cl.[5] G01P *7/00, 15/00;* **G09G** *1/00*

U.S. Cl. 364—566 **21 Claims**



1. A movable input device for inputting information to a remote computer, comprising

a generally hexahydral housing;

means for sensing position, attitude and motion of said movable input device with respect to a three-dimensional coordinate system and producing information describing said position, attitude and motion; and

wireless means for communicating said information to said remote computer, said wireless communicating means including a plurality of interface ports operating in parallel and provided on said housing, at least one of said interface ports being arranged on each external face of said housing so that at least one interface port will be directed generally at said computer regardless of the orientation of said movable input device with respect to said computer.

5,181,182

MULTI-LEVEL BAND-RESTRICTED WAVEFORM GENERATOR

Kenzo Urabe, Sendai, and Yoshihiko Akaiwa, Munakata, both of Japan, assignors to Kokusai Electric Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1991, Ser. No. 813,806

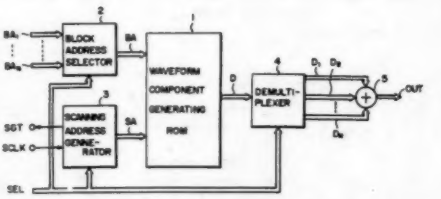
Int. Cl.[5] G06F *1/02*

U.S. Cl. 364—718 **2 Claims**

1. A multi-level band-restricted waveform generator for deriving a multi-level band-restricted waveform from an M-level (a natural number, M−2) signal sequence, comprising:

a read-only memory wherein M kinds of waveforms on N symbol periods define one symbol group, each of which takes one of M levels from said M-level signal sequence on one symbol period and takes the value zero on all the other (N−1) symbol periods in said one symbol group, are used as elementary waveforms, the band-restricted waveform of (k/N)-th symbol group (where (K/N)=(x) is the smallest integer greater than x and k is the symbol length of an impulse response determined by said band restriction) corresponding to a sequence of (k/N) elementary waveforms is precalculated as waveform components, and said waveform components are stored in a memory block identified by block addresses each composed of an M-level sequence with a length of (k/N) digits corresponding to said sequence of (k/N) elementary waveforms, in the order of time series specified by an additional scanning address;

a block address selector wherein N sets of M-level signal sequences for specifying the first to the N-th sequences each including (k/N) elementary waveforms, formed so that the sum of said elementary waveforms of each set is equal to said M-level signal sequence, are selected on a



time-shared basis and provided as said block addresses to said read-only memory;

a scanning address generator wherein N scanning addresses shifted from each other by a 1/N period (one symbol period) are selected on a time-shared basis in synchronization with the time-shared selection of said block addresses and provided as said additional scanning addresses to said read only memory;

a demultiplexer wherein N parallel outputs are obtained by demultiplexing N waveform components read out of said read-only memory on a time-shared basis; and

an adder wherein said outputs are added together and output as said multi-level band-restricted waveform.

5,181,183

DISCRETE COSINE TRANSFORM CIRCUIT SUITABLE FOR INTEGRATED CIRCUIT IMPLEMENTATION

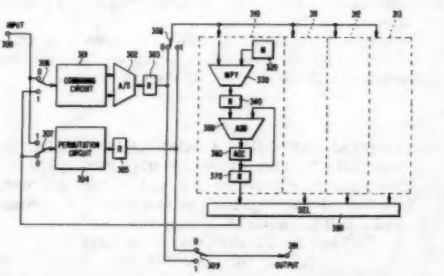
Takashi Miyazaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 17, 1991, Ser. No. 642,571

Claims priority, application Japan, Jan. 17, 1990, 2-6440

Int. Cl.[5] G06F *15/332*

U.S. Cl. 364—725 **12 Claims**



1. A discrete cosine transform (DCT) circuit for performing DCT or inverse DCT (IDCT) with N ($N=2^x$ where x is a natural number) input data in response to a selection signal fed from the outside so as to produce transformed data, said DCT circuit comprising:

(a) first switch means for producing first selected input data by selecting, in response to the selection signal, either one

of input data and selected accumulation data produced in said DCT circuit;

(b) combining circuit means for transforming N of said first selected input data into N/2 combination data each comprising a combination of two predetermined data;

(c) adding and subtracting means for producing N subtraction and addition data by adding first and second data of each of said combination data and subtracting said second data from said first data;

(d) second switch means for producing second selected input data by selecting, in response to the selection signal, either one of said input data and said selected accumulation data;

(e) permutation circuit means for outputting permutated data by permutating N of said second selected input data in a predetermined order;

(f) third switch means for outputting data to be transformed by selecting, in response to the selection signal, either one of said addition and subtraction data and said permutated data;

(g) fourth switch means for outputting said transformed data by selecting, in response to the selection signal, the other of said permutated data and said addition and subtraction data;

(h) N/2 transforming circuit means for transforming data having an identical construction and each comprising:

(i) coefficient memory means storing DCT coefficients and IDCT coefficients;

(ii) multiplier means for reading, in response to the selection signal, either one of said DCT coefficients and said IDCT coefficients out of said memory means and multiplying said data to be transformed by said coefficients to produce multiplication data; and

(iii) accumulator means for accumulating said multiplication data a predetermined number of times to output accumulated data;

(i) selector means for selecting said accumulated data from said N/2 transforming circuit means in a predetermined order and feeding said selected accumulated data to said first and second switch means as selected accumulated data.

5,181,184

APPARATUS FOR MULTIPLYING REAL-TIME 2'S COMPLEMENT CODE IN A DIGITAL SIGNAL PROCESSING SYSTEM AND A METHOD FOR THE SAME

Dae-Yoon Shim, Seoul, and Jong-Sang Lim, Suwon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 20, 1990, Ser. No. 540,686

Claims priority, application Rep. of Korea, Jun. 20, 1989, 1989-8480

Int. Cl.[5] G06F *7/52*

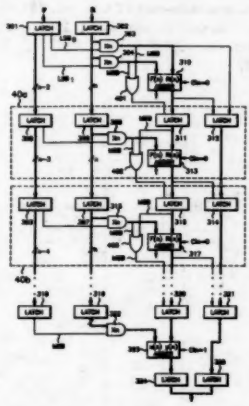
U.S. Cl. 364—758 **12 Claims**

1. A pipeline multiplier, capable of multiplying 2's complement codes, said pipeline multiplier comprising:

a plurality of serially connected partial sum generating means each receiving preceding partial sums and generating present partials sums;

partial sum correcting means for sequentially receiving bits comprising a multiplier and a multiplicand, producing first values by sequentially multiplying said bits by said multiplicand, in logic circuits, and logically combining, in first logic gate circuits, a most significant bit of preceding partial sums with a most significant bit of said first values so as to correct present partial sums; and

a 2's complement correcting means for subtracting a present partial sum generated by a last one of said plurality of serially connected partial sum generating means from a second value produced by logically combining, in a second logic gate circuit, said multiplicand with the most significant bit of said multiplier.



5,181,185

PARALLEL MULTIPLIER USING SKIP ARRAY AND MODIFIED WALLACE TREE

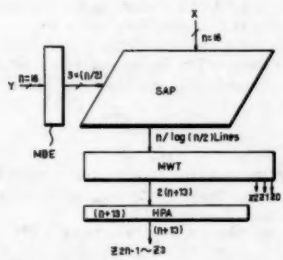
Tack D. Han, and Sang M. Moh, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Jan. 4, 1991, Ser. No. 638,449

Claims priority, application Rep. of Korea, May 31, 1990, 90-8199

Int. Cl.[5] G06F *7/52*

U.S. Cl. 364—760 **7 Claims**



1. A parallel multiplier using a skip array and a modified Wallace tree, comprising:

a modified Booth's encoder for receiving an n-bit multiplier signal and calculating bit-respective (3 *(n/2)) encoded output signals, wherein n represents respective bits of the multiplier signal, according to a modified Booth's algorithm;

a skip array for receiving an n-bit multiplicand signal and having input lines for respectively receiving the encoded output signals and output lines, the skip array calculating a reduced number of n/log (n/2) partial products from the multiplicand and encoded output signals;

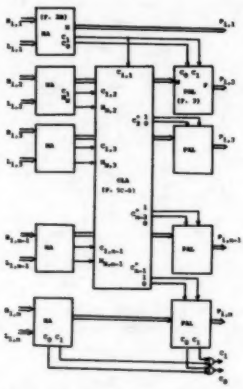
a modified Wallace tree for adding binary bits of the partial products in full adders for providing a final carry output signal and a final sum output signal; and

a hybrid prefix adder for adding the final carry output and sum output signals.

5,181,186
TPC COMPUTERS

Moutad S. Al-Ofi, 4035 Walnut St., Philadelphia, Pa. 19104

Continuation of Ser. No. 476,301, Feb. 7, 1990, abandoned, which is a continuation-in-part of Ser. No. 181,034, Apr. 13, 1988, abandoned. This application Nov. 1, 1991, Ser. No. 789,410
Int. Cl.[5] G06F *7/49, 7/50, 7/52*
U.S. Cl. 364—287 18 Claims

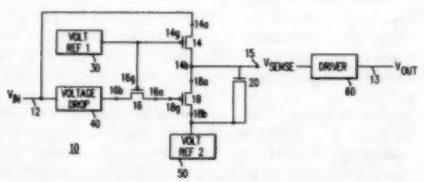


1. A tri-property code(TPC) parallel adder PA for performing the add operation upon two TPC represented operands of n-digit each of radix r each, said PA comprising: n TPC half adders HAs, each having data inputs for receiving two TPC represented digits of r-bits each and output means for delivering TPC represented sum of r-bits, carry and non-nine outputs to other devices; a TPC carry look-ahead CLA, having carry and non-nine inputs coupled to corresponding outputs of the outputs of said HAs and carry outputs for delivering TPC carry look-ahead outputs to other devices; and n−1 TPC full adder logic devices FALs, each having data inputs coupled to sum outputs of a HA of said HAs, carry inputs coupled to corresponding outputs of the outputs of said CLA, and data outputs for delivering a TPC represented r-bit digit comprising together with remaining outputs of said FALs data outputs for said PA.

5,181,187
LOW POWER VOLTAGE SENSING CIRCUIT

Ching S. Jenq, San Jose, Calif., assignor to Silicon Storage Technology, Inc., Sunnyvale, Calif.

Filed Mar. 29, 1991, Ser. No. 677,297
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—182 20 Claims



1. A voltage sensing circuit, for receiving an input voltage signal and for generating an output voltage signal, said circuit comprising:

a sensing node;

a first transistor means of one conduction type, having two ends and a gate; one end connected to receive said input voltage signal, another end connected to said sensing node to provide a sensing signal thereto;

means for receiving said input voltage signal and for generating a first voltage signal, said first voltage signal lower in voltage than said input voltage signal;

a second transistor means of one conduction type, having two ends and a gate; one end connected to receive said first voltage signal;

a first voltage source connected to said gate of said first and second transistor means;

a third transistor means of another conduction type, having two ends and a gate; one end connected to said sensing node, said gate connected to another end of said second transistor means;

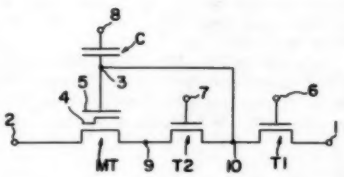
a second voltage source connected to said another end of said third transistor means; and

a driver means connected to said sensing node for receiving said sensing signal and for producing said output voltage signal in response thereto.

5,181,188
SEMICONDUCTOR MEMORY DEVICE

Yoshimitsu Yamauchi; Kenichi Tanaka, both of Nara; Keizo Sakiyama, Kashihara, and Katsumi Fukumoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Abeno, Japan

Filed Jul. 6, 1990, Ser. No. 549,293
Claims priority, application Japan, Jul. 7, 1989, 1-176844; Jul. 25, 1989, 1-191930; Sep. 18, 1989, 1-243162; Oct. 19, 1989, 1-273038; Feb. 23, 1990, 2-043391
Int. Cl.[5] G11C *14/00*
U.S. Cl. 365—228 18 Claims



1. In a semiconductor memory device comprising a volatile memory means and a non-volatile memory means,

said volatile memory means comprises a MOS transistor, and a capacitor means, one electrode of said capacitor means being connected to the source of said MOS transistor,

said non-volatile memory means comprises a floating gate transistor,

said semiconductor memory device further comprises a switch means connected between said source of said MOS transistor and the source/drain of said floating gate transistor,

the control gate of said floating gate transistor being connected to said source of said MOS transistor.

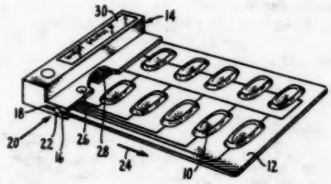
5,181,189
DEVICE FOR THE STORAGE AND TIME-REGULATED DISPENSING OF DRUGS

Dieter Hafner, D-8500 Nurnberg 30, Ostendstr. 132, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 125,298
Int. Cl.[5] G04B *47/00*; B65D *83/04*
U.S. Cl. 368—10 1 Claim

1. In a device for the storage and time-regulated dispensing of drugs consisting of a drug in a drug container in combination with means for providing a signal at preset intervals of time related to the regimen for dispensing the drug, the improvement comprising presenting the drug in a blister pack container, said blister pack container having information relating to the drug presented along an edge thereof, and incorpo-

rating in the means for providing a signal, means for receiving said edge of the blister pack and means for reading said infor-



mation off of said edge of the blister pack when said blister pack is connected to the means for providing a signal by having its edge received therein.

5,181,190

ANALOG ELECTRONIC TIMEPIECE

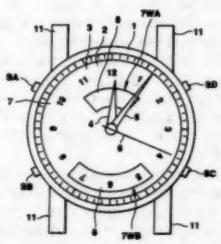
Takashi Kanzaki, Akishima, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1991, Ser. No. 798,697

Claims priority, application Japan, Nov. 30, 1990, 2-336742

Int. Cl.[5] G04C *21/00, 19/00*

U.S. Cl. 368—76 **28 Claims**



1. An analog electronic timepiece comprising:

a dial plate in which at least two openings are formed;

time-indicating hand means for pivotally moving hands on said dial plate to indicate the time;

at least two electric-optical display means mounted below said dial plate to correspond to the openings;

a single shutter plate rotatably mounted between said dial plate and said electric-optical display means; and

shutter-plate movement control means for controlling said single shutter plate to move it to a desired position including first, second, and third positions in its rotational direction;

wherein said single shutter plate is formed in such a shape that it opens all the openings of said dial plate when said shutter plate is located at its first position in its rotational direction, closes all the openings of said dial plate when said shutter plate is located at its second position in its rotational direction, and opens at least one of the openings and also closes at least one of the remaining ones of the openings when said shutter plate is located at its third position in its rotational direction.

5,181,191

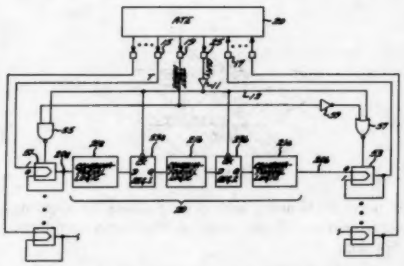
BUILT-IN TEST CIRCUITRY PROVIDING SIMPLE AND ACCURATE AC TEST OF DIGITAL MICROCIRCUITS WITH LOW BANDWIDTH TEST EQUIPMENT AND PROBE STATIONS

William D. Farwell, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 27, 1991, Ser. No. 799,582

Int. Cl.[5] G04F *8/00;* **G01R** *15/12*

U.S. Cl. 368—113 **8 Claims**



1. A test circuit for speed testing a plurality of data propagation paths of an integrated circuit device having a clock buffer and wherein each of the data propagation paths includes (i) a combinatorial logic network or (ii) N combinatorial logic networks and N−1 registers interposed between individual ones of the N combinatorial logic networks, the test circuit for comprising:

a plurality of input storage means for the plurality of data propagation paths for receiving test data from the automatic test equipment and for providing respective input data for the associated data propagation paths; and

a plurality of output storage means for respectively storing the outputs of the respective data propagation paths;

wherein said input and output storage means and any internal registers in the data propagation paths are clocked with alternating single cycles of a first clock that can be arbitrarily slow and a second clock that corresponds to a desired test speed, whereby said first clock is utilized for (a) data transfer between the automatic test equipment and said input storage means and (b) data transfer between said output storage means and said automatic test equipment, and whereby any internal registers in the data propagation path and said output storage means are subjected to active clock transitions at the start and end of each cycle of said second clock such that test data is applied to, and sampled from, the combinatorial logic networks at the rate of the second clock so as to test whether the delays through the combinatorial logic networks are less than or equal to the period of said second clock.

5,181,192

HOUSING FOR AN ENERGY CELL IN A WRISTWATCH

Daniel Paratte, Neuchâtel, and Jean-Pascal Aeschbacher, Moûtier, both of Switzerland, assignors to ETA SA Fabriques d'Ebauches, Granges, Switzerland

Filed Jun. 5, 1991, Ser. No. 710,793

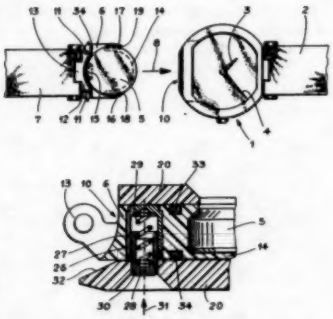
Claims priority, application Switzerland, Jun. 7, 1990, 01910/90

Int. Cl.[5] G04B *37/00*

U.S. Cl. 368—282 **13 Claims**

1. A watch having at least one strand for attaching said watch to a wearer, said watch comprising a watch case, display means for displaying the time of day, an electronic circuit for controlling said display means, an energization cell for energizing said electronic circuit, a drawer for carrying said energization cell, means for connecting said drawer to an end of said strand, a housing for receiving said drawer and said

energization cell, a lateral opening in said watch case through which said energization cell and said drawer may be introduced into said housing, and locking means for securing said drawer to said watch case once said drawer is introduced into said housing.

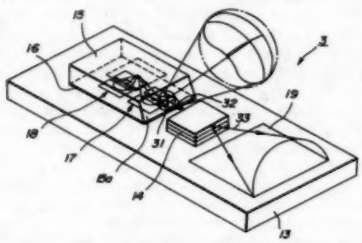


5,181,193

OPTICAL PICKUP DEVICE FOR A RECORDING AND/OR REPRODUCING APPARATUS

Hidehiro Kume, Tokyo; Etsufumi Yamamoto, Kanagawa, and Yoshiyuki Matsumoto, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 1, 1989, Ser. No. 430,132
Claims priority, application Japan, Nov. 22, 1988, 63-295679
Int. Cl.[5] G11B *7/135*
U.S. Cl. 369—44.23 **7 Claims**



1. A recording and/or reproducing apparatus for an optical disk wherein a light beam emitted by a semiconductor laser element is converged by an object lens so as to be irradiated on the optical disk having a plurality of tracks on which data signals are previously recorded, reflected light from said optical disk being detected for reading and/or recording the data signals, wherein the apparatus comprises:

photodetector means having an insensitive central zone and adapted to receive said reflected light to produce tracking error signals; and

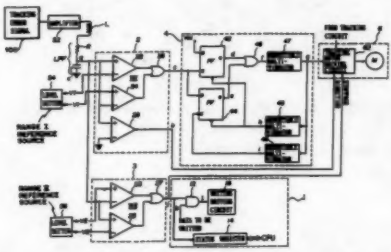
means for projecting said light beam of said semiconductor laser element along an optical axis onto said disk so that a plane extending orthogonally to a junction plane of semiconductor layers of the semiconductor laser element and including said optical axis from an acute angle with respect to a line tangential to the plurality of tracks such that asymmetries on opposite sides of said tangential line resulting from de-focusing of the light beam on the disk are compensated.

5,181,194

WRITING DEVICE FOR OPTICAL MEMORY CARD

Kiyoshi Horie, Yokohama, Japan, assignor to Kabushiki Kaisha CSK, Tokyo, Japan

Filed Nov. 14, 1989, Ser. No. 436,554
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.25 **4 Claims**



1. A writing device for an optical memory card having a plurality of generally parallel data tracks formed adjacent to and extending along track lines, comprising:

a lens, having an optical axis, for imaging data on the data tracks of an optical memory card along track lines;

writing circuit means for writing data on the optical memory card by imaging the data through said lens;

a lens holder which supports said lens, said lens and said lens holder both being mounted for movements at least in directions transverse to a track on the optical memory card;

tracking error range determining means for detecting a tracking error resulting from deviations of said lens optical axis from a track line being tracked and for generating a first tracking error signal when the tracking error is within a first predetermined range $\pm V_1$ representing predetermined distance deviations between the track line and said lens optical axis, and generating a second tracking error signal when the tracking error is within a second predetermined range $\pm(V_2-V_1)$ representing distance variations which exceed the deviations corresponding to said first predetermined range, and a stop signal representing deviations which exceed said second predetermined range limit $\pm V_2$;

drive means responsive to said tracking error detecting means for moving said lens relative to said lens holder to compensate for tracking error signals which fall within said first predetermined range and for moving said lens holder relative to said tracking line when said tracking error signals fall within said second predetermined range; and

writing stoppage means for stopping the writing by said writing means of data on the optical memory card by issuance of a stop signal when said tracking error signals exceeds said first and second predetermined ranges, whereby the writing of data on the wrong data tracks is avoided when excessive deviations are detected.

5,181,195

TRACKING ERROR SIGNAL GENERATOR WITH DC OFFSET CANCELLATION

Hidehiro Kume, Tokyo, and Etsufumi Yamamoto, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 16, 1991, Ser. No. 700,866
Claims priority, application Japan, May 18, 1990, 2-126587
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.41 **4 Claims**

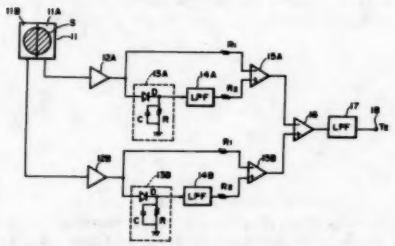
1. A tracking error signal generator comprising:

a photo detector means having first and second optical detecting portions divided in a direction corresponding to a recording track on an optical recording medium, so as to

receive a return light beam reflected from said optical recording medium;

first and second peak detecting means for detecting respective peak values of detection output signals obtained from said first and second optical detecting portions; and

arithmetic means for forming a difference signal between



signals obtained by respectively multiplying an output signal of said first peak detecting means and the detection output of said first optical detecting portion by coefficient values less than 1.0, and signals obtained by respectively multiplying an output signal of said second peak detecting means and the detection output of said second optical detecting portion by the coefficient values less than 1.0.

5,181,196

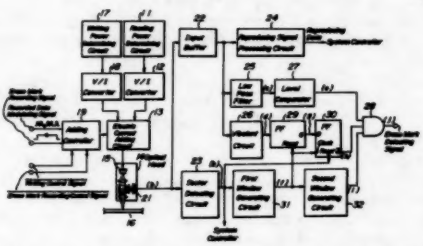
ERASE MARK DETECTING CIRCUIT FOR DETECTING AN ERASE MARK SUPERIMPOSED ON DATA RECORDED ON A SECTOR OF AN OPTICAL RECORDING MEDIUM

Akira Matsueda, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1991, Ser. No. 675,617

Int. Cl.[5] G11B *5/09, 15/52, 20/12, 27/22*

U.S. Cl. 369—48 **21 Claims**



1. An erase mark detecting circuit for use in an optical information recording/reproducing apparatus, in which an erase mark, which is selectively superimposed on information data recorded in selected ones of unit information record areas of an optical information recording medium comprising a plurality of unit information record areas, is detected with the aid of a reproduction signal read out of said optical information recording medium, comprising:

a level detecting means for detecting a mean level of said reproduction signal reproduced from a unit information record area of the optical information recording medium;

an information data detecting means for processing the reproduction signal to detect a presence of information data recorded in the unit information record area; and

an erase mark detecting means for providing a signal indicating detection of an erase mark superimposed on said unit information record area in accordance with a detection by said level detecting means that the means level of the reproduction signal is above a reference value and a detection by said information data detecting means of a said presence of information data in said selected unit information record area.

5,181,197

OPTICAL DISK DRIVER AND OPERATIONAL PROCESSING APPARATUS HAVING SUCH OPTICAL DISK DRIVER

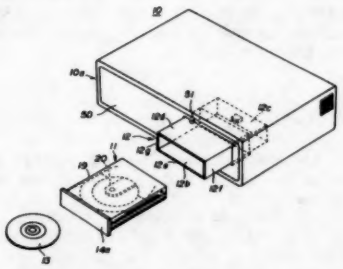
Noboru Sugie, Atsugi; Kenichi Furukawa, Machida; Makoto Ogawa, Kanagawa; Hironori Kurisu, Hadano; Tomonori Mitsui, Zama; Akio Aito; Mitsunori Nakamura, both of Atsugi, and Hiroshi Mochizuki, Kawasaki, all of Japan, assignors to Mitsumi Electric Co., Ltd., Japan

Filed Jan. 28, 1991, Ser. No. 647,731

Claims priority, application Japan, Jan. 31, 1990, 2-8891[U]; Jul. 27, 1990, 2-80192[U]; Jul. 30, 1990, 2-80919[U]; Jul. 31, 1990, 2-81188[U]

Int. Cl.[5] G11B *3/10, 17/04*

U.S. Cl. 369—75.1 **9 Claims**



1. An optical disk driver comprising:

a first case, accommodated in a housing which includes therein an operational processor operatively connected to said first case, said housing having a mouth via which said first case is inserted into the housing and ejected therefrom, said first case including an insertion opening having a shape corresponding to the mouth, there being an aperture between the first case and the mouth;

a second case, movable from a first position to a second position, said second case projecting from the first case so that an optical disk can be inserted and ejected via a top surface of said second case when said second case is located at the first position, said second case being operatively connected to the operational processor via said first case when said second case is located at the second position, said second case being inserted into said first case and projected therefrom via the insertion opening of said first case, said second case having a lid at a top surface thereof, the lid opening when said second case is located at the first position so that the optical disk can be inserted into said second case and ejected therefrom, and the lid being closed when said second case is located at the second position;

driving means for driving the optical disk inserted into said second case;

moving means for moving said second case from the second position to the first position;

opening means for opening the lid;

lock means for locking the lid in order to keep the lid closed; and

lock release means coupled to said lock means for releasing the lock of said lock means, said lock release means releasing the lock of said lock means, and the opening means opening the lid in response to the movement of said second case from the second position to the first position,

wherein said first case comprises:

a pair of positioning members, oppositely located around the

insertion opening, which are respectively inserted into a part of the aperture in order to position the insertion opening of the first case at substantially the center of the mouth when said first case is inserted into the housing, and

fixing means for removably fixing the second case in the first case when the second case is located at the second position, and

wherein said lock means further comprises:

a hook provided on the lid;

a hook lever, mounted on said second case, engageable with the hook when the lid is closed; and

a spring, mounted on said second case, which forces the hook lever in a direction in which the hook lever engages with the hook, the lid being kept closed while the hook and the hook lever are engaged with each other, and

wherein said lock release means further comprises:

a connection member connected to the hook lever;

moving detection means for detecting whether or not said second case has moved to approximately the first position; and

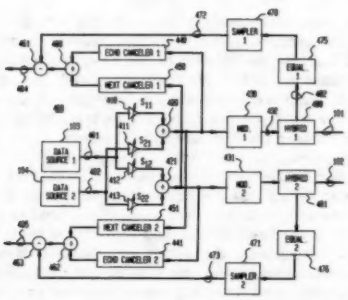
engagement release means for forcing the connecting member in a direction such that the hook is released from being engaged with the hook lever when the moving detection means detects that said second case has moved to approximately the first position.

5,181,198

COORDINATED TRANSMISSION FOR TWO-PAIR DIGITAL SUBSCRIBER LINES

Joseph W. Lechleider, Mendham Township, Morristown, Morris County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Mar. 12, 1991, Ser. No. 668,087
Int. Cl.[5] H04B *3/23, 3/32*
U.S. Cl. 370—32.1 **14 Claims**



1. A transmitter for propagating first and second data sequences originated by first and second data sources, respectively, over first and second transmission lines, the lines being coupled to the transmitter by first and second hybrid arrangements each having transmit and receive ports, and wherein the receive ports of the first and second hybrid arrangements provide first and second sampled input sequences, respectively, each having echo and NEXT interfering components, the transmitter including modulation means for generating first and second line carrier signals, the transmitter comprising

line buffer means, coupled to the first and second data sources, for generating a first composite sequence and a second composite sequence, said first composite sequence being formed from a combination of separately amplified ones of the first and second data sequences, and said second composite sequence being formed from another combination of separately amplified ones of the first and second data sequences; for modulating the first line carrier signal with said first composite sequence to produce a first modulation signal; for modulating the second line carrier signal with said second composite sequence to produce a second modulation signal; for supplying said first modulation signal to the transmit port of the first hybrid arrangement; and for supplying said second modulation signal to the transmit port of the second hybrid arrangement, and

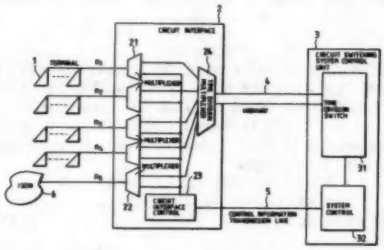
canceler means, coupled to said line buffer means and the receive ports of each of the hybrid arrangements and being responsive to said first and second composite sequences, for canceling the echo and NEXT components in the first and second sampled input sequences.

5,181,199

PACKET SWITCHING SYSTEM

Yuko Motoki, Yokohama; Akinori Honda, Kawasaki, and Takashi Morita, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 31, 1990, Ser. No. 575,689
Claims priority, application Japan, Aug. 31, 1989, 1-223038
Int. Cl.[5] H04L *12/56*
U.S. Cl. 370—60 **10 Claims**



1. A packet switching exchange system connected to an ISDN network and ISDN terminals for exchanging packet data consisting of D-channel data and B-channel data comprising:

a circuit switching system control unit, having resource data, for controlling said exchange system and exchanging said B-channel data from a highway by circuit switching; and

a circuit interface unit, which is connected to the ISDN network and the ISDN terminals, for multiplexing and separating D-channel data and B-channel data sent from said ISDN network and said ISDN terminals according to said control performed by said circuit switching system control unit to send said B-channel data to a highway, and exchanging said D-channel data by packet switching;

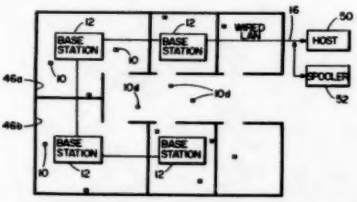
wherein said circuit interface unit includes a conversion table for storing contents of address data included in call setting packets conveyed between said ISDN network and said ISDN terminals, an address for a physical circuit of the ISDN network and the ISDN terminals, and logical channel numbers of packets transmitted between the ISDN terminals and the exchange system and between the exchange system and the ISDN network; and

wherein after reception of said call setting packet, said circuit interface unit recognizes correspondence of a D-channel user packet transmitted between ISDN terminals and the exchange system to a D-channel user packet transmitted between the exchange system and the ISDN network according to said conversion table and a logical channel number of said D-channel user packet and performs D-channel packet switching.

5,181,200
HANDOFF METHOD AND APPARATUS FOR MOBILE WIRELESS WORKSTATION

Colin G. Harrison, Brookfield, Conn., assignor to International Business Machines Corporation

Filed Oct. 29, 1990, Ser. No. 605,720
Int. Cl.[5] H04B 7/26; H04L 12/28
U.S. Cl. 370—85.1 **20 Claims**



1. A method for providing an appearance of a continual connection of a data processor means to a wired network of the type having a plurality of wireless link adapter means each of which bidirectionally passes data to and from the network over a wireless link, the data being transmitted to or received from data processor means having means for coupling to the wireless link, comprising the steps of:

in response to the data processor means breaking the wireless link with a first link adapter means of the plurality of wireless link adapter means,

re-directing to network storage means, with the first link adapter means, any data received from the network that is intended for the data processor means;

in response to the data processor means establishing a link with a second link adapter means of the plurality of wireless link adapter means,

transmitting stored data from the network storage means to the second link adapter means;

receiving with the second link adapter means the data from the storage means; and

sending the received data from the second link adapter means to the data processing means;

in response to the network storage means transmitting all of the stored data to the second link adapter means,

terminating the re-direction of data from the first link adapter means to the storage means; and

receiving from the network, with the second link adapter means, any further data addressed to the data processing means.

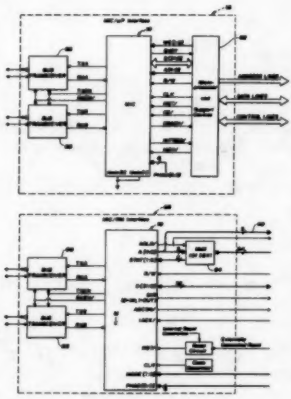
5,181,201
INTERFACE CHIP DEVICE

Craig A. Schauss, Decatur, Ind.; Donald E. Neumann, Huntington Woods, and Dennis A. Bielawski, Romeo, both of Mich., assignors to General Dynamics Land Systems Inc., Warren, Mich.

Continuation-in-part of Ser. No. 476,607, Feb. 7, 1990, abandoned. This application Jan. 30, 1991, Ser. No. 645,901
Int. Cl.[5] H04J 3/02
U.S. Cl. 370—85.1 **13 Claims**

1. A single interface chip device for use in a time-division multiplex serial data bus system having a communications protocol, the device comprising:

first means for controlled information transfer between a processor and said data bus in a processor interface mode, wherein the communications protocol is transparent and includes a plurality of commands and wherein said first means includes means for determining the validity of each

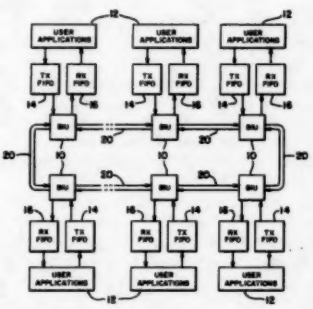


of the commands and providing an echo response message to the data bus in response thereto.

5,181,202
RING BUS STATION HAVING DUAL OSCILLATORS

Robert A. Walser, West Point, Calif., and Earl E. Rydell, Swisher, Iowa, assignors to FMC Corporation, Chicago, Ill.

Filed Feb. 6, 1991, Ser. No. 652,834
Int. Cl.[5] H04J 3/02
U.S. Cl. 370—85.15 **22 Claims**



1. In a first transmit-receive station adapted for connection to a digital data ring bus with a plurality of transmit-receive stations wherein no single transmit-receive station has a master oscillator connected to control the ring bus on a permanent basis and each transmit-receive station has two oscillators, a first of which produces a first clocking signal responsive to the frequency and phase of an incoming pulse train and the second of which produces a second clocking signal and is a crystal controlled oscillator having a frequency essentially equal to the frequency of the incoming data pulse train but at an indeterminate phase:

a transmitter connected to (1) relay data received on said ring bus and (2) send data on said ring bus which originates at said first transmit-receive station; and

means connected to control the frequency and phase of signals outputted from said transmitter (1) from the first clocking signal when relaying the received data and (2) from the second clocking signal when sending said data

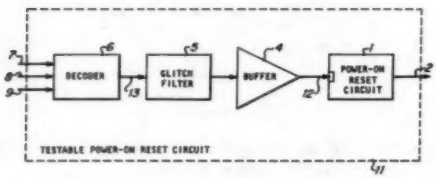
originating at said first transmit-receive station, whereby the second clocking signal serves as a master oscillator for the ring bus during the period used for sending originating data.

5,181,203

TESTABLE POWER-ON-RESET CIRCUIT

Gerald L. Frenkil, Brookline, Mass., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Dec. 21, 1990, Ser. No. 631,544
Int. Cl.[5] G01R *31/28*
U.S. Cl. 371—15.1 **13 Claims**



1. In an electronic device, a testable power-on-reset circuit which allows reset of the electronic device without de-coupling a power signal from the electronic device, the testable power-on-reset circuit comprising:

reset circuitry including a reset power line on which is placed a reset power signal and including a reset output upon which the reset circuitry places a first reset signal value responsive to the reset circuitry initially detecting the reset power signal on the reset power line and upon which the reset circuitry places a second reset signal value responsive to a period of time passing from the reset circuitry initially detecting the reset power signal on the reset power line;

buffer means, having an input and having an output, the output being coupled to the reset power line of the reset circuitry, for providing the reset power signal to the reset power line of the reset circuitry and for removing the reset power signal form the reset power line of the reset circuitry; and,

buffer control means, coupled to the input of the buffer means, for, in response to a predetermined condition, causing the buffer means to remove the reset power signal from the reset power line of the reset circuitry.

5,181,204

METHOD AND APPARATUS FOR ERROR TRACKING IN A MULTITASKING ENVIRONMENT

Alexander Kasman, Sherman Oaks, Calif., assignor to Telefonaktienbolaget L M Ericsson, Stockholm, Sweden

Filed Jun. 27, 1990, Ser. No. 544,413
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—16.5 **11 Claims**

1. A method for setting an error flag comprising the steps of:

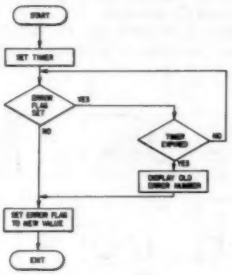
setting a timer;

determining whether or not said error flag is presently set;

setting said error flag to a new value if said error flag is not presently set;

determining whether or not said timer is expired if said error flag is not presently set;

displaying the held value of said presently set error flag and resetting the error flag if said timer is expired; and



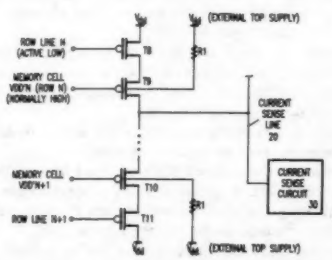
redetermining whether said error flag remains set if said timer is not expired.

5,181,205

SHORT CIRCUIT DETECTOR CIRCUIT FOR MEMORY ARRAYS

Robert A. Kertis, Puyallup, Wash., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 10, 1990, Ser. No. 507,692
Int. Cl.[5] G11C *11/40, 29/00*
U.S. Cl. 371—21.1 **9 Claims**



1. A circuit for detecting voltage supply short circuits in an array of static random access memory cells, said cells being arranged in rows and each row selectable in response to a signal on a row select line, said cells having a memory matrix voltage supply derived from an external power supply, said circuit comprising:

a first and second transistor, for each row of said cells, coupled in a series, the gates of said first and second transistor coupled respectively to said row select line and to said memory matrix voltage supply, the source of said first transistor coupled to said external power supply, and the drain of said first transistor coupled to the source of said second transistor;

a current sense line coupled to the drain of said second transistor;

a current detector circuit coupled to said current sense line for generating a logic output signal in response to current flow along said current sense line; and

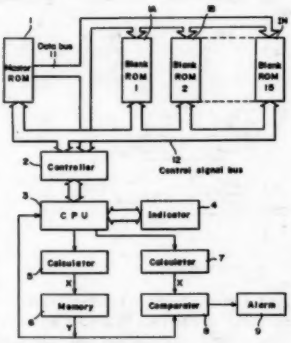
means for selectively biasing each of said first transistors in a conductive state and for activating said detector circuit such that in response to an improper voltage on said memory matrix voltage supply corresponding when the voltage at said second circuit node rises above a predefined value.

5,181,206

PROM WRITER HAVING CHECK SUM FUNCTION

Ryoji Hashiguchi, Tokyo, Japan, assignor to Ando Electric Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1990, Ser. No. 549,343
Claims priority, application Japan, Jul. 12, 1989, 1-179762
Int. Cl.[5] G06F *11/10*; G11C *29/00*
U.S. Cl. 371—21.5 2 Claims



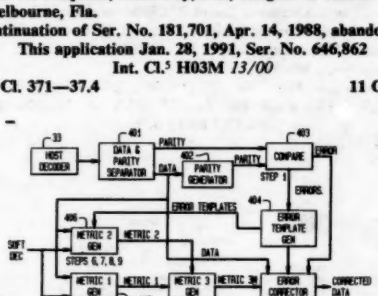
1. A PROM writer for writing data stored in a master ROM **1** into a plurality of blank ROMs **1A–1N** by means of a data bus connected between the master ROM and the blank ROMs, characterized in that the writer comprises first calculator means **5** for calculating a check sum value X of the first data from the master ROM **1** serving as reference data, memory means **6** for storing the first check sum value X and classifying such as check sum value Y, second calculator means **7** for calculating check sum values X of the second and subsequent data from the master ROM **1**, comparator means **8** for comparing the check sum value Y of the reference data with the second and subsequent check sum values X, successively, and alarming means **9** for issuing an alarm upon receipt of a non-coincident signal representative of a difference between the check sum value Y and any of the second and subsequent check sum values X and which signal is outputted from the comparator means **8**.

5,181,207

ERROR CORRECTION MECHANISM USING PATTERN PREDICTIVE ERROR CORRECTION CODES

Daniel H. Chapman, Palm Bay, Fla., assignor to Harris Corp., Melbourne, Fla.

Continuation of Ser. No. 181,701, Apr. 14, 1988, abandoned.
This application Jan. 28, 1991, Ser. No. 646,862
Int. Cl.[5] H03M *13/00*
U.S. Cl. 371—37.4 11 Claims



6. A system for correcting errors in information signals that are encoded at a transmitter site, transmitted over a communication channel to a receiver site and decoded at said receiver site to recover the original information signals comprising:

at said transmitter site,

first means for processing said original information signals to obtain first signals representative of characteristics of said information signals;

second means for combining said original information signals and said first signals and encoding the combined signals; and

third means for transmitting the encoded combined signals over said communication channel to said receiver site; and

at said receiver site,

fourth means for receiving and demodulating the encoded combined signals that have been transmitted over said communication channel and producing demodulated signals representative of the encoded combined signals and soft decision signals representative of the level of confidence as to how accurately said demodulated signals represent the encoded combined signals; and

fifth means for subjecting the demodulated and soft decision signals produced by said fourth means to a decoding mechanism to derive output signals representative of the original information signals combined with said first signals; and

sixth means for processing said derived output signals, in accordance with the signal processing mechanism through which the original information signals were processed by said first means to obtain said first signals, and in accordance with the soft decision signals produced by said fourth means and generating therefrom an error pattern template corresponding to the pattern of errors in said output signals, processing said derived output signals in accordance with said error pattern template and said decoding mechanism, so as to identify where, within said derived output signals, errors are located, and modifying selected ones of said derived output signals in that portion thereof identified in accordance with said error pattern template; and wherein

said sixth means comprises

means for processing said derived output signals in accordance with the signal processing mechanism used by said first means to obtain said first signals; and

means for comparing contents of the signals processed by said derived output signals processing means with contents of said received signals and generating therefrom said error pattern template; and wherein

said sixth means comprises

means for encoding said derived output signals in accordance with the encoding mechanism employed by said second means to obtain re-encoded output signals;

means for encoding said derived output signals in accordance with the encoding mechanism employed by said second means to obtain re-encoded output signals;

means for comparing the accuracy of the re-encoded output signals with the accuracy of the encoded combined signals received and demodulated by said fourth means and producing therefrom second signals representative of differences therebetween;

means for combining respective pluralities of said second signals to obtain respective pluralities of third signals;

means for selectively modifying the contents of a respective plurality of said derived output signals in accordance with the error pattern of said error pattern template, so as to obtain fourth signals representative of a modified version of said derived output signals;

means for encoding said fourth signals in accordance with the encoding mechanism employed by said second means, so as to obtain an encoded modified version of said derived output signals;

means for comparing the accuracy of the encoded fourth signals with the accuracy of the encoded combined signals obtained by said fourth means, and producing therefrom fifth signals representative of differences therebetween;

means for combining a respective plurality of said fifth signals to obtain a respective sixth signal;

means for causing the operation of said fourth signal through sixth signal obtaining means to be repeated for successive

pluralities of said derived output signals, thereby obtaining a plurality of said sixth signals;

means for generating seventh signals representative of differences between respective ones of said third and sixth signals;

means for processing seventh signals to obtain eighth signals; and

means for locating the beginning of the occurrence of errors, in said derived output signals, at that derived output signal, the corresponding eighth signal for which has a prescribed value relative to the remaining ones of said eighth signals.

5,181,208

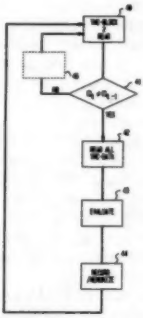
COMPUTATION-CONSERVING TRAFFIC DATA TRANSMISSION METHOD AND APPARATUS

Ralf Duckeck, Hildesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 7, 1989, Ser. No. 447,578

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—40.1 **10 Claims**



1. A method for evaluating traffic announcements received in digitally encoded form in a data packet formatted according to Technical Standard 3244-E of the European Broadcasting Union and thus containing a plurality of data blocks, each block consisting of an information word followed by an error correction checkword, in which method the data packet is decoded and the traffic announcements are stored in memory after decoding and evaluation,

comprising, in accordance with the invention, the steps of

decoding at least one data packet and extracting therefrom information as to how many traffic announcements will be broadcast in one complete cycle of announcements, before broadcasting of a repetition or second cycle of said announcements begins;

using said checkwords in detecting and correcting any errors in information words representing traffic announcements;

storing the thus-corrected traffic announcements in memory until a first complete cycle of announcements has been stored;

identifying, in said data packet, at least one bit indicating whether any announcement in said cycle has been updated; and

decoding and storing, in memory, a further complete cycle of announcements if and only if an update is indicated, thereby conserving computation capacity when an update is not indicated.

5,181,209

METHOD FOR GENERALIZING THE VITERBI ALGORITHM AND DEVICES FOR EXECUTING THE METHOD

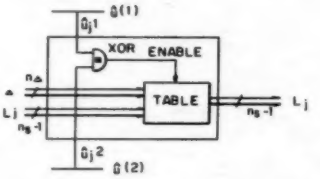
Joachim Hagenauer, and Peter Höher, both of Seefeld, Fed. Rep. of Germany, assignors to Deutsche Forschungsanstalt Fur Luft- Und Raumfahrt E.V., Cologne, Fed. Rep. of Germany

Filed Apr. 3, 1990, Ser. No. 504,357

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1989, 3910739

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—43 **7 Claims**



1. A method for generalizing a conventional Viterbi algorithm in which transition costs are formed in a transition metric unit (TMU) and adding, comparing and selection are performed in a succeeding add-compare-select unit (ACS), comprising the steps of

calculating different costs from two arriving paths for each individual state;

setting a reliability information at the beginning of each path at a highest value;

updating a reliability value of the path with least costs where information points differ from a competing path by performing said updating in accordance with a table;

feeding a prior value of the reliability information and difference costs ( ) into the table as input values:

taking the said input values from the table and storing said values along with hard decisions, as path memory, in the form of fixed or floating point values;

reading out an analog value decision from a point which, after a defined decision delay (δ) is the result for the path with the lowest cost;

said hard decisions of the conventional Viterbi algorithm being signs of an analog value decision.

5,181,210

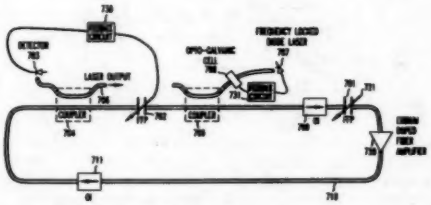
ELECTRICALLY TUNABLE FIBER RING LASER

Yun C. Chung, Aberdeen; David J. DiGiovanni, Scotch Plains; Julian Stone, Rumson; James W. Sulhoff, Ocean, and John L. Zyskind, Shrewsbury, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 706,135, May 28, 1991, Pat. No. 5,132,976. This application Jan. 13, 1992, Ser. No. 820,110

Int. Cl.[5] H01S *3/30*

U.S. Cl. 372—6 **4 Claims**



1. A ring laser, comprising:

an optical fiber ring;

means for introducing optical gain into said optical fiber ring, said gain exceeding the optical loss of said optical fiber ring, so as to produce light by laser action; and

means for tuning the frequency of said laser light;

characterized in that said frequency tuning means includes a first fiber Fabry-Perot etalon operating as a mode selector and a second fiber Fabry-Perot etalon acting as a tuning element.

5,181,211

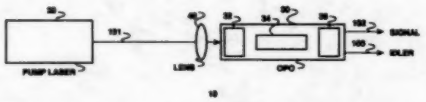
EYE-SAFE LASER SYSTEM

Ralph L. Burnham, Reston; Jeffrey J. Kasinski, Fairfax, and Larry R. Marshall, Reston, all of Va., assignors to Fibertek, Inc., Herndon, Va.

Filed May 20, 1991, Ser. No. 702,531

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—21 **4 Claims**



10

1. A solid state laser beam producing system comprising:

a first means for producing a first beam having a pumping wavelength range of from 1.0 um to 1.1 um; a second means, nonlinear and rotatable with respect to three defined X, Y, and Z principal axes for converting said first beam into a second signal beam, and a third idler beam; said second beam having a signal wavelength of from 1.5 um to 2.2 um and said third beam having an idler wavelength given by the frequency difference between the said first beam and said second beam and wherein said first beam travels parallel to one of the said principal axes of the said second means; and said second beam is polarized by polarization means in a direction parallel to a second of said three principal axes and said third beam is polarized in a direction parallel to the third of said principal axes such that non-critical phase matching is achieved and wherein said second converted signal beam has an eyesafe wavelength of no more than 2.2 um.

5,181,212

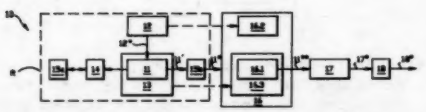
METHOD OF EMITTING ON A SPECIFIC WAVELENGTH FRAUNHOFER LINE USING A NEODYMIUM DOPED LASER TRANSMITTER

Victor L. Moberg, San Diego, Calif., assignor to The United State of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 31, 1991, Ser. No. 816,514

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—22 **17 Claims**



1. A method of emitting on a specific wavelength Fraunhofer line of peak seawater transmission and minimum solar radiation comprising:

emitting at least on a specific wavelength of an infrared transition line from a neodymium gain element in an optical resonator;

frequency tripling the emitted infrared line from said optical resonator to a specific ultraviolet wavelength in a frequency multiplier; and

Raman down-shifting said specific ultraviolet wavelength a predetermined degree by a predetermined number of Stokes shifts in a predetermined medium in a Raman shifter to produce a high peak-power output at said specific wavelength Fraunhofer line.

5,181,213

OPTICAL PULSE GENERATING APPARATUS

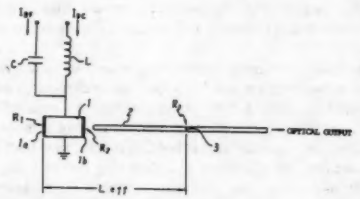
Kiichiro Shinokura, Tendo, and Hitoshi Kawaguchi, Yonezawa, both of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 24, 1991, Ser. No. 734,973

Claims priority, application Japan, Jul. 27, 1990, 2-199880

Int. Cl.[5] H01S *3/13*; G02B *6/26*

U.S. Cl. 372—30 **8 Claims**



1. An optical pulse generating apparatus comprising a semiconductor laser medium and an external resonator for oscillating the semiconductor laser medium, in mode locking with a frequency of an injected current, to generate optical pulses;

wherein said external resonator comprises an optical waveguide path including a reflecting element for reflecting part of a laser beam emitted from the semiconductor laser medium;

said reflecting element having a reflection wavelength characteristic wherein a center wavelength in a high-reflectivity wavelength range falls within a gain wavelength range of the semiconductor laser medium and a half-amplitude level is equal to or lower than twice an interval between longitudinal modes dependent on an element's length of the semiconductor laser medium.

5,181,214

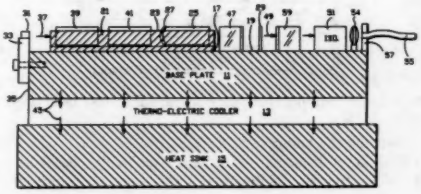
TEMPERATURE STABLE SOLID-STATE LASER PACKAGE

Josef Berger, Santa Clara; Doron Mick, Sunnyvale, and Joseph Kleefeld, Palo Alto, all of Calif., assignors to Harmonic Lightwaves, Inc., Santa Clara, Calif.

Filed Nov. 18, 1991, Ser. No. 793,582

Int. Cl.[5] H01S *3/04*

U.S. Cl. 372—34 **32 Claims**



1. A solid-state laser package comprising

a heat sink,

a thermo-electric cooler mounted on said heat sink,

a thermally conductive, low thermal expansion, base mounted on said thermo-electric cooler,

means for applying an electric current to said thermo-elec-

tric cooler so as to cause heat flow between said base and said heat sink at a rate determined by said electric current,

a solid material laser active medium mounted on said base,

reflective means mounted on said base for defining an optical resonant cavity, said active medium positioned within said cavity,

a laser diode means mounted to said base for producing a first laser beam with a first wavelength thermally tuned to match an absorption band of said active medium at an operating temperature,

means for focusing and directing said first laser beam into an end of said active medium, said reflective means being transparent to said first wavelength to admit said first laser beam into said cavity containing said active medium,

means for measuring a temperature of said laser to which said active medium, said reflective means, said laser diode means and said focusing and directing means are mounted, and

temperature stabilizing means, responsive to said temperature measuring means, for adjusting said electric current applied to said thermo-electric cooler to maintain said temperature of said base at said operating temperature, said active medium, said reflective means, said laser diode means and said focusing and directing means being optically aligned at said operating temperature to provide a laser beam output from said cavity, said temperature stabilizing means thereby maintaining said optical alignment.

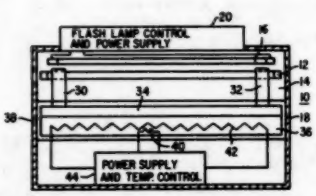
5,181,215
HEATED SOLID STATE LASER

Richard C. Sam, 30020 Torrepines Pl., Agoura Hills, Calif. 91301; Kenrick R. Leslie, 516 West Fairview Blvd., Inglewood, Calif. 90302, and James E. Goodwin, 1864 Dorrit St., Newbury Park, Calif. 91323

Filed Nov. 22, 1991, Ser. No. 796,147

Int. Cl.[5] H01S *3/04*

U.S. Cl. 372—34 **13 Claims**



1. A flash lamp pumped, air cooled, solid state laser apparatus comprising:

a laser pump chamber;

a flash lamp disposed within said laser pump chamber;

a solid state laser rod disposed within said laser pump chamber;

a pair of thermal conductive supports extending into said laser pump chamber and engaging said solid state laser rod in proximity to its ends for supporting said laser rod; and

means for heating said pair of thermal conductive supports so as to heat said laser rod by applying heat in proximity to its ends.

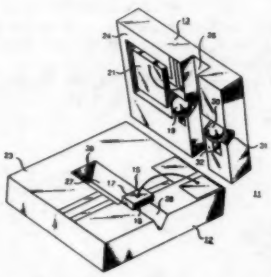
5,181,216
PHOTONICS MODULE APPARATUS

David A. Ackerman, Hopewell; Greg E. Blonder, Summit, and William M. MacDonald, Stockton, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 572,592, Aug. 27, 1990, Pat. No. 5,124,281. This application Mar. 2, 1992, Ser. No. 844,018

Int. Cl.[5] H01S *3/04*

U.S. Cl. 372—36 **7 Claims**



1. An optical device comprising:

a first member having in a first surface thereof a first V-shaped groove having first and second side walls;

a second V-shaped groove in said first surface which intersects said first groove and defines a first V-shaped edge in the first side wall of said first groove;

a spherical lens seated in said first groove such that it bears against two points of said first V-shaped edge and against one point of the second side wall of said first V-shaped groove, said spherical lens being permanently bonded within said first groove.

5,181,217
LASER OSCILLATOR CIRCUIT

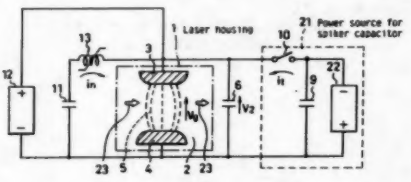
Yukio Sato; Akihiro Suzuki; Mitsuo Inoue; Kenyu Haruta, and Haruhiko Nagai, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1991, Ser. No. 727,432

Claims priority, application Japan, Feb. 27, 1991, 3-33024; Feb. 28, 1991, 3-34381

Int. Cl.[5] H01S *3/00*

U.S. Cl. 372—38 **11 Claims**



1. In a laser oscillator circuit including;

a laser housing filled with a laser gas, a first main electrode and a second main electrode which are contained in said housing in a manner that one faces the other,

a spiker capacitor connected in parallel with said first and second main electrodes,

a sustainer capacitor connected in parallel with said first and second main electrodes through a magnetic isolator, therebetween,

a spiker charging power source for charging said spiker capacitor, and

a sustainer charging power source which charges said sustainer capacitor in an opposite polarity with respect to

said spiker charging power source charging said spiker capacitor;

a laser oscillator circuit characterized in that;

said magnetic isolator is configured so that: it shifts from an OFF state to an ON state, during a process of charging said spiker capacitor by said spiker charging power source in a polarity opposite to that of said sustainer capacitor which had first been charged by said sustainer charging power source, before a terminal voltage of said spiker capacitor reaches a breakdown voltage which allows an initiation of discharge between said first and second main electrodes, in a manner such that

said shift causes an application of a sharp-rise pulse voltage across said first and second main electrodes by a transfer of electric charge from said sustainer capacitor to said spiker capacitor, to initiate the discharge between said first and second electrodes in a polarity opposite to that of said spiker charging power source.

5,181,218

MANUFACTURING METHOD OF SEMICONDUCTOR LASER WITH NON-ABSORBING MIRROR STRUCTURE

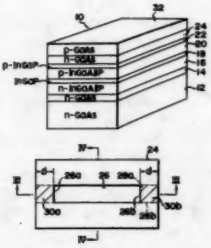
Masayuki Ishikawa, Tokyo; Hajime Okuda; Hideo Shiozawa, both of Yokohama; Kazuhiko Itaya, Tokyo; Yukio Watanabe, Yokohama; Mariko Suzuki, Yokohama, and Genichi Hatakoshi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 450,063, Dec. 13, 1989, Pat. No. 4,987,096. This application Nov. 29, 1990, Ser. No. 619,606

Claims priority, application Japan, Dec. 14, 1988, 63-315618

Int. Cl.[5] H01S 3/19

U.S. Cl. 372—45 **20 Claims**



1. A semiconductor laser device comprising:

a semiconductive substrate;

a first cladding layer provided above said substrate;

an active layer provided on said first cladding layer;

a second cladding layer provided on said active layer, said second cladding layer including a waveguide channel region to which a current is mainly supplied in an oscillation mode of said laser, and an output end portion from which an oscillated laser light is externally sent forth;

a current-blocking layer provided on said second cladding layer, having an opening defined above a central region of said waveguide channel region, said current-blocking layer covering said output end portion of said second cladding layer; and

said active layer including. in a peripheral portion adjacent to said output end portion of said second cladding layer, a specific band gap region having a first energy band gap which is larger than a second energy band gap in a substantially central region of said active layer.

5,181,219

SURFACE EMISSION TYPE SEMICONDUCTOR LASER

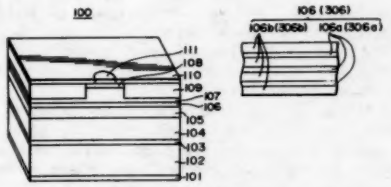
Katsumi Mori; Tatsuya Asaka, and Hideaki Iwano, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Sep. 9, 1991, Ser. No. 756,979

Claims priority, application Japan, Sep. 12, 1990, 2-242000

Int. Cl.[5] H01S 3/19

U.S. Cl. 372—45 **24 Claims**



1. A surface emission type semiconductor laser for emitting a laser beam in a direction perpendicular to a semiconductor substrate in which said laser is formed, said semiconductor laser comprising:

optical resonator means including a pair of reflecting mirrors having different reflectivities and a plurality of semiconductor layers between said reflecting mirros, the semiconductor layers including at least a cladding layer in said semiconductor layers being formed into at least one column-like portion;

a II-VI group compound semiconductor epitaxial layer surrounding said at least one column-like portion; and

an active layer of multi-quantum well structure formed at a lower layer section of said cladding layer having the column-like structure, said active layer including a plurality of well layers each of which is sandwiched between barrier layers.

5,181,220

SEMICONDUCTOR LIGHT EMITTING LIGHT CONCENTRATION DEVICE

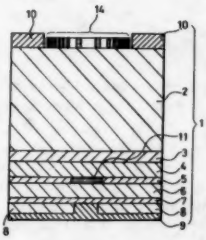
Tetsuya Yagi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 886,094, Jul. 16, 1986, Pat. No. 5,038,354. This application Apr. 26, 1991, Ser. No. 691,864

Claims priority, application Japan, Jul. 16, 1985, 60-159055

Int. Cl.[5] H01S 3/19

U.S. Cl. 372—45 **11 Claims**



9. A semiconductor light emitting and light concentrating device, comprising:

a semiconductor light emitting region having a front surface and a rear surface opposite from said front surface;

a semiconductor substrate formed at said rear surface of said semiconductor light emitting region wherein the outside surface of the substrate comprises the rear surface of the device;

a plurality of epitaxial layers including said light emitting

region laminated on said semiconductor substrate, wherein said plurality of epitaxial layers including said light emitting region comprises a buffer layer formed on said semiconductor substrate, a first clad layer formed on said buffer layer, an active layer formed on said first clad layer, a second clad layer formed on said active layer, a contact layer formed on said second clad layer and an insulating layer formed on said contact layer and the outer surface of said plurality of epitaxial layers opposed to the rear surface of the device comprises the upper surface of said plurality of epitaxial layers;

a first electrode affixed to said insulating layer;

a second electrode fixed to the rear surface of said semiconductor substrate; and

a light collecting multiple diffraction ring for collecting light emitted from said light emitting region formed by conducting an ion injection of impurities into said rear surface of said substrate wherein said light collecting multiple diffraction ring has a narrower energy band gap than that of said active layer.

5,181,221

SURFACE EMISSION TYPE SEMICONDUCTOR LASER

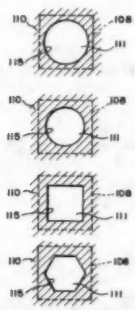
Katsumi Mori; Tatsuya Asaka, and Hideaki Iwano, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Sep. 9, 1991, Ser. No. 756,980

Claims priority, application Japan, Sep. 12, 1990, 2-242000

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—46 **20 Claims**



1. A surface emission type semiconductor laser for emitting a laser beam in a direction perpendicular to a semiconductor substrate in which said laser is formed, said semiconductor laser comprising:

optical resonator means including a pair of reflecting mirrors having different reflectivities and a plurality of semiconductor layers between said reflecting mirrors, the semiconductor layers including at least a contact layer and a cladding layer in said semiconductor layers being formed into at least one column-like portion;

a II-VI group compound semiconductor epitaxial layer surrounding said at least one column-like portion; and

an exit-side electrode formed in contact with a part of said contact layer, said electrode having an opening formed therein at a position including a geometric center of said contact layer and ranging between 10% and 90% of a surface area of said contact layer, said opening being formed to receive an exit-side reflecting mirror in said pair of reflecting mirrors.

5,181,222

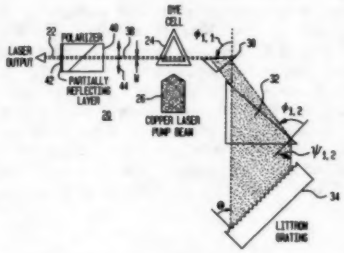
LASER OSCILLATOR

Francisco J. Duarte, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 4, 1992, Ser. No. 831,011

Int. Cl.[5] H01S *3/20*

U.S. Cl. 372—53 **16 Claims**



1. A laser apparatus comprising:

an optical cavity having at one end means for reflecting polarized narrow linewidth laser emission and at the other end a partially reflecting polarizer device which serves as an output coupler of the cavity for a narrow linewidth laser beam; and

means for generating narrow linewidth laser emissions within the optical cavity of a desired wave length, unpolarized amplified spontaneous emission (ASE) also being generated in the cavity, the partially reflecting polarizer device having its plane of polarization oriented parallel to the plane of polarization of the narrow linewidth laser beam such that non-polarized amplified spontaneous emission (ASE) is substantially reduced in intensity, the length of the optical cavity is short and the free spectral range (FSR) is longer than the dispersive linewidth of the laser.

5,181,223

HIGH-EFFICIENCY MODE-MATCHED TRANSVERSELY-PUMPED SOLID STATE LASER AMPLIFIER

Thomas M. Baer, Mountain View, and David F. Head, Sunnyvale, both of Calif., assignors to Spectra-Physics, Incorporated, Mountain View, Calif.

Continuation of Ser. No. 404,162, Sep. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 360,848, Jun. 2, 1989, abandoned, which is a continuation of Ser. No. 195,713, May 18, 1988, Pat. No. 4,837,771, which is a continuation-in-part of Ser. No. 103,557, Sep. 30, 1987, Pat. No. 4,785,459, which is a continuation-in-part of Ser. No. 35,530, Apr. 7, 1987, Pat. No. 4,756,003, which is a continuation-in-part of Ser. No. 811,546, Dec. 19, 1985, Pat. No. 4,656,635, which is a continuation-in-part of Ser. No. 730,002, May 1, 1985, Pat. No. 4,653,056. This application Jun. 12, 1991, Ser. No. 714,790

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[5] H01S *3/09*

U.S. Cl. 372—69 **23 Claims**

1. A mode-matched, diode-pumped, solid-state laser amplifier, including:

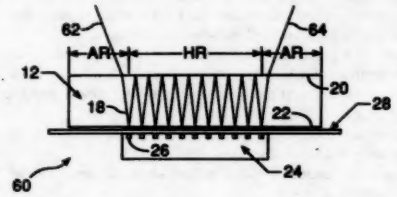
a block of laser material having a pair of opposed sides,

a zig-zag optical path within said block between said pair of opposed sides having a plurality of legs, pairs of which meet at vertices at a preselected fold angle,

a plurality of laser diode pumping sources positioned adjacent to one of said opposed sides and optically coupled to said one of said opposed sides,

means, interposed between said laser diode pump sources and said block, for aligning pump radiation from said laser diode pump sources with one of said vertices of said zig-zag optical path and with respect to said block such that

the optical path of pump radiation from each of said pump sources is substantially coincident with one of said legs,



and for mode matching the mode volume of said pump radiation with said optical path in said block.

5,181,224

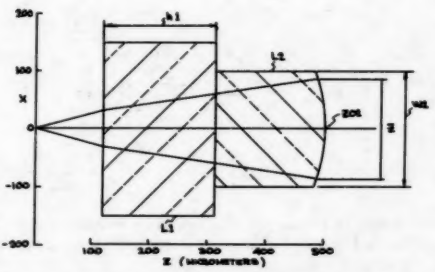
MICROOPTIC LENSES

James J. Snyder, San Jose, Calif., assignor to University of California, Livermore, Calif.

Filed May 10, 1991, Ser. No. 697,974

Int. Cl.[5] H01S *3/08*

U.S. Cl. 372—101 **35 Claims**



1. A crossed microlens system for collimating the output of a diode laser, comprising:

a diode laser outputting a laser beam from a noncircular aperture having a fast axis defined by the narrowest dimension of said noncircular aperture, and a slow axis orthogonal to said fast axis, said fast axis diverging faster than the slow axis;

first cylindrical microlens means having a shape and position for collimating said diode laser beam in a plane parallel to the fast axis; and

second cylindrical microlens means having a shape and position for collimating light from said first lens means in a plane parallel to the slow axis.

5,181,225

RECEIVER FOR A DSSS SIGNAL

Fredy D. Neeser; Markus D. Hufschmid, both of Zurich, and Jürg P. Ruprecht, Muri, all of Switzerland, assignors to Ascom Tech. AG., Bern, Switzerland

Filed Nov. 21, 1991, Ser. No. 795,477

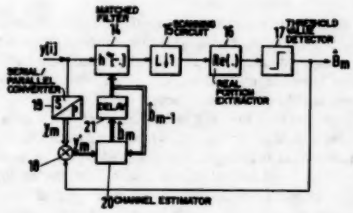
Claims priority, application Switzerland, Nov. 22, 1990, 3701/90

Int. Cl.[5] H04L *9/20*; H04B *1/12*

U.S. Cl. 375—1 **10 Claims**

2. A receiver for a DSSS (direct sequence spread spectrum) signal having digital data in the form of symbols (B_m) spread out in the DSSS signal with a predetermined pulse sequence (s[.]) having a length (L), comprising an approximated inverse filter connected in said receiver for detecting the symbols (B_m) in the incoming signal and connected for excitation by the predetermined pulse sequence (s[.]) to respond approximately with a Kronecker delta sequence as the output sequence, a channel-adapted matched filter connected after said approximated inverse filter, and said channel-adapted matched filter having connected therewith:

(a) first means connected for estimating the transmitted symbols according to the maximum likelihood principle,



(b) second means connected for reducing the output signal of said inverse filter with the use of the estimated symbols to one channel transient response per symbol, and

(c) third means connected for determining the coefficients of said channel-adapted matched filter.

5,181,226

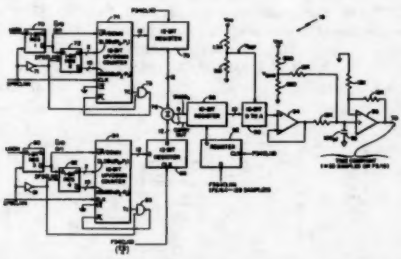
THRESHOLD LEVEL GENERATOR

Robert H. Cantwell, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 546,645, Jul. 2, 1990, Pat. No. 5,120,997, which is a division of Ser. No. 319,504, Mar. 6, 1989, Pat. No. 4,972,430. This application Sep. 26, 1991, Ser. No. 765,843

Int. Cl.[5] H04L *27/30*; H03K *5/153*

U.S. Cl. 375—1 **3 Claims**



1. A threshold level generator for a spread spectrum signal detector comprising:

first register means for storing a sign bit sample of an in-phase (I) component of a carrier signal in accordance with a clock signal;

first up/down counter means coupled to said first register means for counting up or down as determined by a logic level of the I component sign bit sample stored in said first register means;

second register means coupled to an output of said first register means for storing said I component sign bit sample in accordance with said clock signal one-half clock period later for underflow and overflow control of said first up/down counter means;

a set output of said second register is coupled to a least significant bit of said first up/down counter means and a reset output of said second register is coupled to most significant bits of said first up/down counter means for providing continuous operation of said first up/down counter means during overflow and underflow conditions;

third register means coupled to the output of said first up/-

down counter means for storing an output of said first up/down counter means;

fourth register means for storing a sign bit sample of a quadrature-phase (Q) component of said carrier signal in accordance with said clock signal;

second up/down counter means coupled to said fourth register means for counting up or down as determined by a logic level of the Q component sign bit sample stored in said fourth register means;

fifth register means coupled to an output of said fourth register means for storing said Q component sign bit sample in accordance with said clock signal one-half clock period later for underflow and overflow control of said second up/down counter means;

a set output of said fifth register is coupled to a least significant bit of said second up/down counter means and a reset output of said fifth register is coupled to ten most significant bits of said second up/down counter means for providing continuous operation of said second up/down counter means during overflow and underflow conditions;

sixth register means coupled to the output of said second up/down counter means for storing an output of said second up/down counter means;

adder means coupled to the outputs of said third register means and said sixth register means for determining a sum of the outputs of said first up/down counter means and said second up/down counter means; and

digital to analog converter means for converting said sum to a zero-mean threshold level (T0).

5,181,227

RECEIVER HAVING A SIGNAL DETECTOR AND BIT SYNCHRONIZER

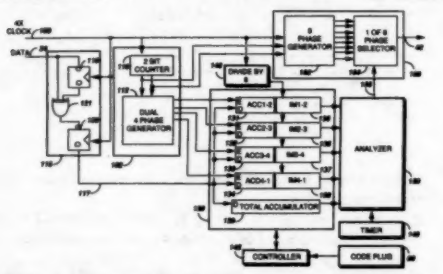
Michael J. DeLuca, Boca Raton; Richard A. Erhart, Boynton Beach, and Joan S. DeLuca, Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 460,215, Jan. 2, 1990, Pat. No. 5,077,758. This application Oct. 8, 1991, Ser. No. 773,173

The portion of the term of this patent subsequent to Dec. 31, 2008, has been disclaimed.

Int. Cl.[5] H03D *03/00;* **H03C** *27/06*

U.S. Cl. 375—95 **22 Claims**



18. A receiver for receiving a signal having transitions between symbols occurring at a predetermined baud rate and having information within the symbols, comprising:

demodulator means for demodulating the signal;

means for selectively detecting the presence or absence of the signal, the means comprising:

a multiplicity of counting registers;

means for establishing an integer number of sample windows per symbol, each sample window having a corresponding unique combination of a plurality of counting registers within said multiplicity of counting registers;

means for selecting either presence detection or absence detection;

means for receiving a transmitted signal and producing a received signal having transitions;

means for sensing the transitions of the received signal occurring within each established sample window;

means for counting in the counting registers corresponding to each sample window in which a transition is sensed; and

means generating a presence signal in response to the selection of presence detection and a counting register having a first predetermined number of counts; and

means for generating an absence signal in response to the selection of absence detection and all of the counting registers exceeding a second predetermined number of counts;

means for conserving power to the demodulator means in response to the absence signal; and

means for processing the information in response to the presence signal.

5,181,228

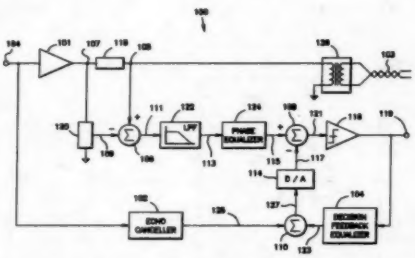
SYSTEM AND METHOD FOR PHASE EQUALIZATION

Hiroshi Takatori, Sacramento, Calif., assignor to Level One Communications, Inc., Folsom, Calif.

Filed Oct. 12, 1990, Ser. No. 596,220

Int. Cl.[5] H04B *1/10*

U.S. Cl. 375—103 **5 Claims**



1. A switched capacitor filter circuit for reducing precursor intersymbol interference in a digital subscriber loop, the circuit comprising:

(a) input means for accepting received data pulses;

(b) filter means, coupled to the input means, for modifying phase and amplitude characteristics of the received data pulses to create phase and amplitude modified pulses, the filter means comprising a plurality of capacitor and switch pairs coupled to an amplifier to provide a z-transfer function T(z) of a form:

$$T(z) = G \times \frac{A - z^{-1}}{1 - B \times z^{-1}}$$

wherein G, A and B are fixed but adjustable coefficients; and

(c) output means, coupled to the filter means, for outputting the phase and amplitude modified pulses.

5,181,229

DATA TRANSMISSION ARRANGEMENT USING A STATISTIC CODING, A TRANSMITTER AND A RECEIVER SECTION SUITABLE FOR SUCH AN ARRANGEMENT

Thierry Langlais, Issy Les Moulineaux; Jean-Paul Bastien, Maisse, and Jean-Yves Boisson, Clamart, all of France, assignors to Telecommunications Radioelectriques El Telephoniques, Paris, France

Filed Dec. 28, 1989, Ser. No. 458,121

Claims priority, application France, Dec. 30, 1988, 88 17498

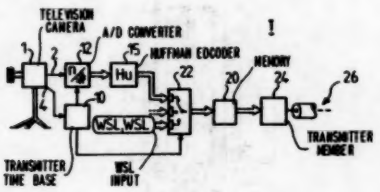
Int. Cl.[5] H04N *5/04, 7/133*

U.S. Cl. 375—114 **3 Claims**

1. An apparatus for encoding an image signal comprising a

plurality of line signals into sequences of digital codewords, said apparatus comprising:

a) means for converting a line signal into a series of digital samples;



b) means, coupled to said converting means, for statistically encoding each of said digital samples so as to form a series of first codewords; and

c) means, coupled to said encoding means, for forming a sequence of digital codewords by appending at least two statistically coded self-synchronizing codewords to the end of said series of said first codewords.

5,181,230

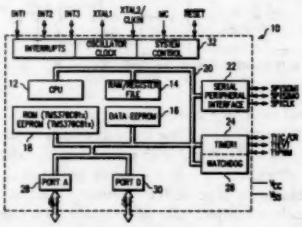
Patent Not Issued For This Number

5,181,231

NON-VOLATILE COUNTING METHOD AND APPARATUS

Harsh B. Parikh, Houston, and Robert M. Crosby, Missouri City, both of Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.

Filed Nov. 30, 1990, Ser. No. 620,499
Int. Cl.[5] H03K *21/40*
U.S. Cl. 377—26 **27 Claims**



1. A method of storing a count in a non-volatile memory comprising the steps of:

storing a number in a non-volatile memory section comprising a plurality of predefined memory units each operable to store a portion of said number; and

varying the order in which said portions are stored in said memory units; and

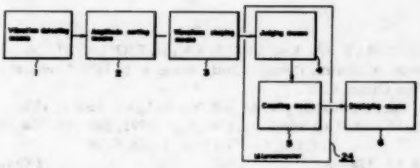
translating each of said portions prior to said storing step such that the number of bits stressed by each storing step is minimized.

5,181,232

DIESEL ENGINE REVOLUTION COUNTER

Shigeo Take, Yokosuka, Japan, assignor to Oppama Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed Apr. 3, 1991, Ser. No. 679,924
Claims priority, application Japan, Nov. 14, 1990, 2-307515
Int. Cl.[5] H04B *1/10*; H03K *21/02*
U.S. Cl. 377—30 **7 Claims**



1. A diesel engine revolution counter comprising:

means for detecting the vibration propagating through a fuel injection pipe of a diesel engine and for converting said vibration to an electric signal;

amplitude sorting means for receiving the electric signal and for providing an output signal comprising individual pulse groups, said pulse groups corresponding to respective fuel injection cycles;

waveform shaping means for receiving the output signal and for converting respective pulse groups of said output signal into a pulse output signal, said pulse output signal comprising individual pulses, each of said pulses having a pulse width equal to the duration of its corresponding pulse group;

judging means for receiving the pulse output signal, determining from respective pulses whether the period between respective pulses deviates from the preceding period between respective pulses by more than a predetermined amount and thereby determining whether the respective pulses of the pulse output signal are normal pulses or not;

counting means for receiving said pulse output signal and for counting the number of pulses per unit time of only the normal pulses; and

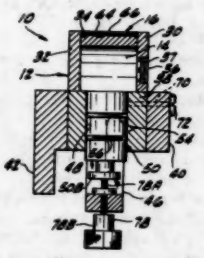
display means for displaying the number of revolutions corresponding to the counted value from the counting means.

5,181,233

SPECIMEN HOLDER

William J. Rink; Joseph B. Schlenoff, and Haim H. G. Mathias, all of Tallahassee, Fla., assignors to Florida State University, Tallahassee, Fla.

Filed Nov. 8, 1991, Ser. No. 790,203
Int. Cl.[5] G01N *23/20*
U.S. Cl. 378—79 **16 Claims**



9. A specimen holder for use on X-ray diffraction spectrom-

etry apparatus, the holder comprising a housing having a specimen chamber therein and a window defining a wall of the chamber capable of transmitting x-radiation from the diffraction apparatus into the chamber, the housing having a generally vertically extending passageway, the window being capable of absorbing at least about 90 percent of K_β X-rays from the diffraction apparatus, and means for rotatably supporting the specimen in the housing wherein said supporting means being capable of slidably sealing reception in the passageway.

5,181,234

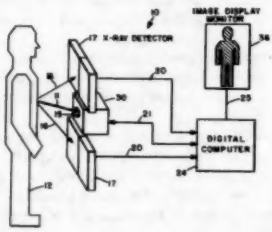
X-RAY BACKSCATTER DETECTION SYSTEM

Steven W. Smith, Poway, Calif., assignor to IRT Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 563,041, Aug. 6, 1990, abandoned. This application May 22, 1991, Ser. No. 704,292

Int. Cl.[5] G01N *23/04;* **G06K** *9/46*

U.S. Cl. 378—87 **42 Claims**



12. Radiant energy imaging apparatus for detecting objects carried on a person's body comprising:

radiant energy imaging means providing an image signal representative of said person's body and objects carried on said person's body by detecting radiant energy modulated by the body;

memory means for storing a library of reference image features derived from previously imaged human bodies;

computational means for comparing features of said image signal to anatomical features of said reference image features to identify anatomical features of said image signal; and

display means for presenting a display signal representative of said image signal wherein its anatomical features have been suppressed.

5,181,235

ROTARY-ANODE TYPE X-RAY TUBE

Katsuhiro Ono, Utsunomiya; Hidero Anno; Hiroyuki Sugiura, both of Ootawara, and Takayuki Kitami, Tochigi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1991, Ser. No. 766,126

Claims priority, application Japan, Oct. 19, 1990, 2-279350

Int. Cl.[5] H01J *35/24*

U.S. Cl. 378—133 **36 Claims**

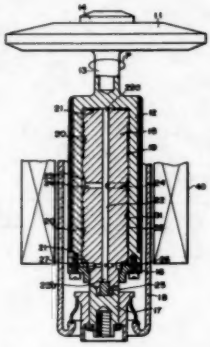
1. A rotary-anode type X-ray tube comprising:

an anode target;

a rotary structure which has a rotation center axis and to which said anode target is fixed;

a stationary structure, coaxially arranged with said rotary structure, for rotatably supporting said rotary structure; and

a hydrodynamic bearing formed between said rotary structure and said stationary structure, said hydrodynamic bearing having a gap in which a metal lubricant is applied, the metal lubricant being in liquid state during rotation of said rotary structure, said hydrodynamic bearing including a reaction layer in contact with the metal lubricant, the reaction layer having been reacted with at least one element of gallium (Ga), indium (In), bismuth (Bi) or tin (Sn) and having a thickness greater than or equal to 1 μm.



5,181,236

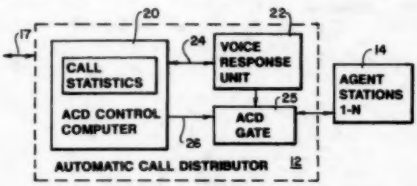
AUTOMATIC CALL RETURNING METHOD FOR CALL DISTRIBUTOR WITH MESSAGE RECORD CAPABILITY

James R. LaVallee; Jerry M. Hilsenbeck, both of Naperville; James G. Brown, Lombard; Roger A. Sumner, Batavia; Andre C. Zazzera, St. Charles, and Dana A. Bailey, Aurora, all of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 25, 1990, Ser. No. 587,878

Int. Cl.[5] H04M *1/64, 15/06, 3/42;* **H04Q** *3/64*

U.S. Cl. 379—67 **24 Claims**



1. In a call switching system having an automatic call distributor for selectively switching incoming calls from callers to a group of agent stations and with means for recording messages from the callers in the event a selected group of agent stations is not available to receive the incoming calls, a method for return of calls to callers who have recorded a message, comprising the steps of:

indicating to the automatic call distributor when an agent is available to receive a recorded message;

automatically connecting through the automatic call distributor, as an incoming call, a recorded message to the agent station indicated as available to receive a recorded message;

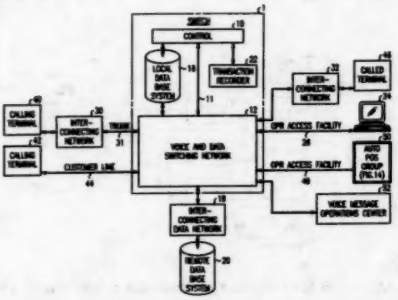
enabling an agent to transcribe the recorded message at the agent station; and

providing the telephone number of the caller who left the recorded message to facilitate a return call.

5,181,237
AUTOMATION OF TELEPHONE OPERATOR ASSISTANCE CALLS

Douglas C. Dowden; Richard W. Hemmeter, both of Naperville; Diane E. Herr, Warrenville, all of Ill.; William K. McCormick, Chester; Robert Petrelli, East Brunswick, both of N.J.; Richard J. Piereth, Naperville, Ill.; Samuel M. Salchenberger, Elmhurst, Ill.; Chander S. Sehgal, Naperville, Ill., and Mahendra K. Verma, Mariboro, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 596,809, Oct. 12, 1990. This application Mar. 27, 1991, Ser. No. 675,779
Int. Cl.[5] H04M *3/50, 7/00*; H04Q *3/72*
U.S. Cl. 379—88 **11 Claims**



1. In a switching system for connection to an attended operator position, a method of establishing a call comprising the steps of:

responsive to receiving a number for identifying a calling customer, establishing a connection from said switching system to means for recognizing spoken commands for the identified calling customer;

recognizing a spoken command from said calling customer for identifying a number of a called customer corresponding to said spoken command of said calling customer, said spoken command being individual to said calling customer; and

establishing a call to a telephone station identified by said identified number;

wherein said means for recognizing spoken commands communicate with said switching system by data messages essentially identical to data messages for communicating with said attended operator position.

5,181,238
AUTHENTICATED COMMUNICATIONS ACCESS SERVICE

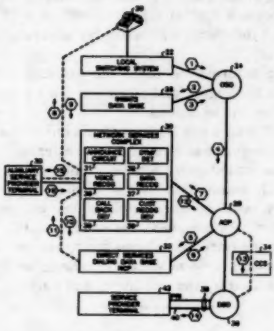
John B. Medamana, Matawan; John W. Palmer, Atlantic Highlands, and Roy P. Weber, Bridgewater, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 31, 1989, Ser. No. 359,823
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—95 **27 Claims**

1. A method of providing authenticated and authorized communications access to a called destination, comprising the steps of:

in a switching office, responsive to receipt of a call comprising a called number identifying said destination, data identifying a caller, and authentication data, querying a data base means for accessing data, using said called number, said identifying data and said authentication data to verify authentication of said caller and authorization by said destination of access by said caller; and

responsive to a positive verification response from said data base extending said call toward said destination;

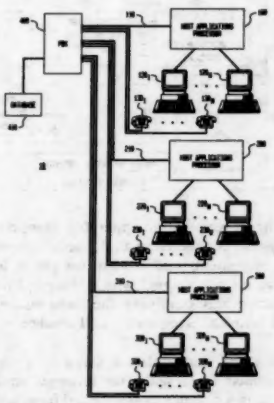


wherein said data identifying said caller comprises an automatically identified telephone number.

5,181,239
CALL TAGGING USER INFORMATION IN A TELEPHONIC ENVIRONMENT

Charles H. Jolissaint, Sunnyvale, Calif., assignor to ROLM Systems, Santa Clara, Calif.

Continuation of Ser. No. 565,076, Aug. 9, 1990, abandoned. This application Mar. 27, 1992, Ser. No. 861,172
Int. Cl.[5] H04M *3/58*
U.S. Cl. 379—96 **14 Claims**



1. Method for coordinating the transfer of a telephone call and information associated with the telephone call in a telephony environment comprised of (a) at least two telephones which interface with a switch and (b) at least tow display apparatus, one of the at least two display apparatus interfaces with one of at least two applications processor systems which are interfaced to the switch and another of the at least two display apparatus interfaces with another of the at least two applications processor systems which are interfaced to the switch, wherein one of the at least two telephones is associated with a called party who also uses one of the at least two display apparatus and another one of the at least two telephones is associated with a called party who also uses another one of the at least two display apparatus, the method comprising the steps of:

adding a record to a database associated with the switch in

response to a telephone call from a calling party to a called party, which record comprises information pertaining to the calling party;

transmitting at least some of the information to an applications processor system which interfaces with the switch and which interfaces with a display apparatus used by the called party;

transmitting information form the applications processor system to the switch and storing at least a portion of the information in the record;

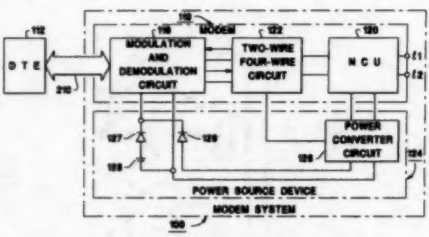
retrieving at least some portion of the information from the record in response to a request to transfer the calling party to another called party whose telephone is connected to the switch and which uses a display apparatus which interfaces with another applications processor system which also interfaces with the switch; and

transferring the retrieval information to the another applications processor system which interfaces with the display apparatus used by the another called party.

5,181,240
DATA CIRCUIT-TERMINATING EQUIPMENT WITH POWER SOURCE DEVICE

Satoshi Sakuragi, Yokohama; Takeshi Ikeda, Sagamihara, and Takashi Kuroda, Yokohama, all of Japan, assignors to Murata Mfg. Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 425,923, Oct. 24, 1989, abandoned. This application May 8, 1991, Ser. No. 696,935
Claims priority, application Japan, Nov. 4, 1988, 63-144263
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—98 **28 Claims**



1. A data circuit-termination apparatus, comprising:

a modem system connected to a telephone circuit and a data terminal equipment, said modem system at least for demodulating a circuit signal which is input from said telephone circuit and supplying the demodulated signal to said data terminal equipment, said modem system comprising:

a modulation and demodulation circuit for modulating a signal supplied from said data terminal equipment and demodulating a circuit signal supplied from said telephone circuit;

a two-wire four-wire circuit connected to said modulation and demodulation circuit;

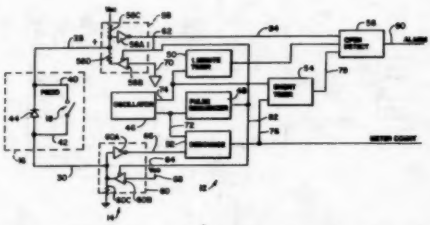
a power source device for extracting a power from an offhook current which flows on said telephone circuit at the time of offhook and supplying said power to said modulation and demodulation circuit; and

a net control circuit for supplying power from the circuit signals in the offhook current which flows on the telephone circuit to said power source device and supplying a signal current from the offhook current to said two-wire four-wire circuit, said net control circuit including a constant current circuit and a smoothing circuit for smoothing said offhook current output from said constant-current circuit, said net control circuit including a circuit for supplying said offhook current to said constant current circuit, said supplying circuit being activated upon detection of an offhook state.

5,181,241
LEAD LINE SUPERVISION SYSTEM

Donald H. Strobel, Brookfield; Donald F. Pridemore, Hartford, and Greg M Gomez, Wauwatosa, all of Wis., assignors to Badger Meter, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 404,686, Sep. 8, 1989, Pat. No. 5,025,470, which is a division of Ser. No. 109,446, Jun. 19, 1987, Pat. No. 4,866,761, which is a continuation-in-part of Ser. No. 876,896, Jun. 20, 1986, Pat. No. 4,817,131. This application Apr. 30, 1991, Ser. No. 693,662
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—107 **17 Claims**



12. A circuit for detecting malfunction conditions in a data transmission system for passing data between a data transmitting station and a data receiving station over first and second data transmission lines, said data transmitting station having current gating means coupling said first and second data transmission lines, said malfunction detection circuit comprising:

first signal generating means for providing data pulses of a first polarity;

first sensing means for sensing the presence of said first data pulses for at least a first predetermined duration and providing a first sensing signal when said data signal exceeds said first predetermined duration;

output circuit means for receiving said first sensing signal and providing an output signal indicative of a malfunction;

second detection signal generating means for providing a second detection signal of a second polarity for at least a second predetermined duration;

second sensing means for sensing the presence or the absence of said second detection signal for at least said second predetermined duration and providing a second sensing signal when the absence of said detection signal exceeds said second preselected duration; and

output circuit means for receiving said second sensing signal and providing an output signal indicative of the absence of said second sensing signal.

5,181,242
QUICK RELEASE LATCH MECHANISM FOR A TELEPHONE HANDSET

Larry D. Stack, Colfax, N.C., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 31, 1990, Ser. No. 607,018
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—445 **25 Claims**

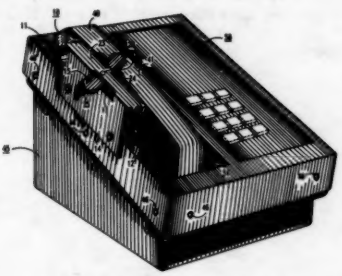
1. A latching mechanism for restraining a telephone handset in a handset cradle, the mechanism comprising:

a floating toggle type latch member having a support surface for positioning in contact with the telephone handset;

a support member for the latch member, the support member comprising a generally upstanding inverted L-shaped member having an upstanding portion and an outwardly extending portion, the latch member being spatially aligned with the outwardly extending portion of the sup-

port member and connected at a single point to said outwardly extending portion of the support member for permitting rotation of the latch member; and

a spring member connected to both the latch member and



the support member for rotating the latch member to a closed position, the support surface of the latch member being positioned in contact with the telephone handset in said closed position and restraining the handset in the handset cradle.

5,181,243

SYSTEM AND METHOD FOR COMMUNICATIONS SECURITY PROTECTION

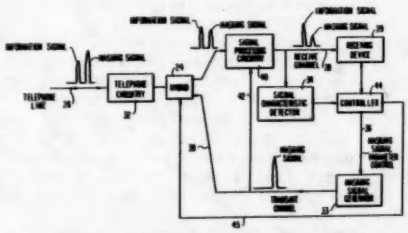
John M. Saltwick, Phoenix; Dean Scarinci, Glendale; William O. Sparks, Cave Creek, and Geoffrey W. Gates, Phoenix, all of Ariz., assignors to Syntellect, Inc., Phoenix, Ariz.

Filed May 19, 1989, Ser. No. 354,261

The portion of the term of this patent subsequent to Sep. 15, 2009, has been disclaimed.

Int. Cl.[5] H04K *1/02*

U.S. Cl. 380—6 **32 Claims**



1. In a communication system wherein information signals are generated by a sending device and communicated to a receiving device, said information signals being dual tone multi-frequency digits, each digit of which is represented by one of four row frequencies and one of four column frequencies, apparatus for securing said information signals comprising:

means for superimposing a masking signal on said information signals to generate composite communicated signals, rendering interceptions of said communicated signals unintelligible, said masking signal consisting of at least two row frequencies or at least two column frequencies; and

means for extracting said information signal from said composite communicated signals.

5,181,244

Patent Not Issued For This Number

5,181,245

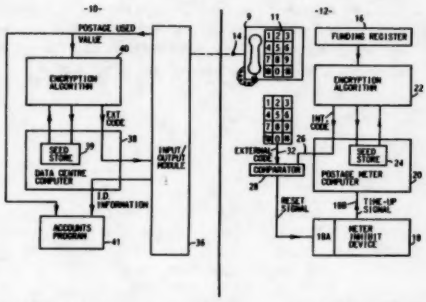
MACHINE INCORPORATING AN ACCOUNTS VERIFICATION SYSTEM

John L. R. Jones, Laindon, United Kingdom, assignor to Pitney Bowes plc., Harlow, England

Filed May 28, 1991, Ser. No. 706,442

Int. Cl.[5] H04K *1/00*

U.S. Cl. 380—23 **4 Claims**



1. A machine incorporating an accounts verification system, and having means therein for generating accounting data, said machine including:

a funding register for storing accounting data inclusive of funds accounting data;

inhibiting means operable to inhibit operation of said machine following a predetermined period of time or a predetermined number of cycles of operation of the machine where determination of said predetermined period of time and said number of cycles are independent of said funds accounting data;

machine processor means for generating a code dependent on the accounting data stored in said funding register (said code being herein referred to as an internally generated code); and

means for comparing said internally generated code with an independently and externally generated code (herein referred to as an external code) and for resetting the inhibiting means to allow operation of the machine for a further predetermined interval when the internal code and the external code correspond.

5,181,246

PRIVACY COMMUNICATION DEVICE

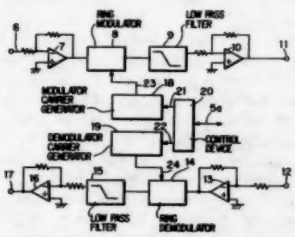
Tsutomu Miki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1991, Ser. No. 746,017

Claims priority, application Japan, Aug. 20, 1990, 2-220658

Int. Cl.[5] H04K *1/00*

U.S. Cl. 380—34 **14 Claims**



6. A privacy communication device, comprising:

a modulator for modulating a voice signal by using a carrier before transmission by radio;

a demodulator for demodulating a voice signal by using a carrier after reception by radio;

carrier generating means for producing carrier of a specific frequency specified in accordance with a control signal out of a plurality of frequencies prepared in advance and applying it to said modulator and said demodulator; and

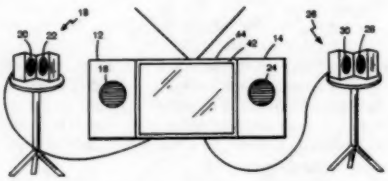
control signal transmitting and receiving means for transmitting and receiving said control signal by radio through a channel different from a voice channel, wherein said carrier generating means gives carriers of different frequencies to said modulator and said demodulator.

5,181,247

SOUND IMAGE ENHANCING

Timothy Holl, Medway, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Jul. 23, 1990, Ser. No. 557,307
Int. Cl.[5] H04R *5/02*
U.S. Cl. 381—24 **19 Claims**



1. A speaker system comprising,

a left channel input and a right channel input for receiving left channel and right channel signals respectively,

a left channel driver coupled to said left channel input,

a right channel driver coupled to said right channel input,

an (L-R) driver unit coupled to both said left channel input and said right channel input having structure arranged to passively differentially combine the signals on said inputs to provide an (L-R) acoustic output signal, and

an (R-L) driver unit coupled to both said left channel input and said right channel input having structure arranged to passively differentially combine the signals on said inputs to provide an (R-L) acoustic output signal,

wherein said (L-R) driver unit comprises a first left ambience driver coupled to said left channel input and a second left ambience driver coupled to said right channel input 180 degrees out of phase with said left ambience driver, and

said (R-L) driver unit comprises a first right ambience driver coupled to said right channel input and a second right ambience driver coupled to said left channel input 180 degrees out of phase with the latter right ambience driver,

wherein said left channel driver, said first left ambience driver, and said second right ambience driver are connected tin series to said left channel input, and

said right channel driver, said first right ambience driver, and said second left ambience driver are connected in series to said right channel input,

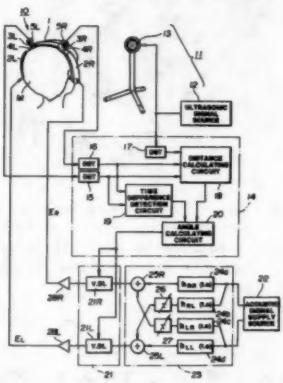
wherein said drivers have impedance that aid said (L-R) driver unit to produce an output that is a predetermined amount of decibels louder than the output of said left channel driver, and said (R-L) driver unit to produce an output that is a predetermined amount of decibels louder than the output of said right channel driver.

5,181,248

ACOUSTIC SIGNAL REPRODUCING APPARATUS

Kiyofumi Inanaga, Kanagawa; Yashuhiro Iida, Tokyo; Hiroyuki Sogawa, Kanagawa, and Susumu Yabe, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 16, 1991, Ser. No. 641,681
Claims priority, application Japan, Jan. 19, 1990, 2-008516
Int. Cl.[5] H04R *5/00*
U.S. Cl. 381—25 **5 Claims**



1. An acoustic signal reproducing apparatus for use with headphone devices, comprising:

a reference signal source for transmitting a reference signal for detecting an orientation of a listener's head,

a pair of signal detection means arranged at respective positions on the listener's head for receiving the reference signal transmitted by said reference signal source,

calculating means for calculating changes in orientation of the listener's head relative to an imaginary sound source on the basis of output signals from said pair of signal detection means and producing an output signal representing said changes in orientation,

transmission characteristic processing means including a plurality of signal processing sections receiving input left and right channel acoustic signals and having preset impulse response coefficients indicative of transmission characteristics to each ear of the listener for providing a left channel and a right channel of input acoustic signals with predetermined transmission characteristics representing the location of said imaginary sound source relative to the listener's ears, said plurality of signal processing sections comprising

a first signal processing section for subjecting the right channel of said input acoustic signals to a convolutional integration of an impulse response indicative of constant transmission characteristics to the right ear of the listener of the acoustic signals reproduced from the right channel of the input acoustic signals,

a second signal processing section for subjecting the right channel of said input acoustic signals to a convolutional integration of an impulse response indicative of constant transmission characteristics to the left ear of the listener of the acoustic signals reproduced from the right channel of the input acoustic signals,

a third signal processing section for subjecting the left channel of said input acoustic signals to a convolutional integration of an impulse response indicative of constant transmission characteristics to the right ear of the listener of the acoustic signals reproduced from the left channel of the input acoustic signals,

a fourth signal processing section for subjecting the left channel of said input acoustic signals to a convolutional integration of an impulse response indicative of constant

transmission characteristics to the left ear of the listener of the acoustic signals reproduced from the left channel of the input acoustic signals,

first adder means for adding an output of said first signal processing section and an output of said third signal processing section and producing the left channel signal, and

second adder means for adding an output of said second signal processing section to an output of said fourth signal processing section and producing the right channel signal, and

acoustic signal processing means receiving the right and left channel signals output respectively from said first and second adder means of said transmission characteristic processing means for controlling the level and delay characteristics thereof in response to said output signal representing said changes in orientation from said calculating means,

the input acoustic signals being reproduced by the headphone devices from outputs of said acoustic signal processing means.

5,181,249

THREE CHANNEL AUDIO TRANSMISSION AND/OR REPRODUCTION SYSTEMS

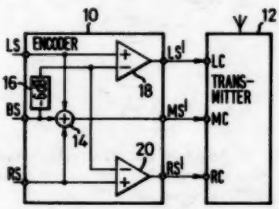
Richard F. Schiller, Basingstoke, England, assignor to Sony Broadcast and Communications Ltd., Basingstoke, England

Filed Apr. 29, 1991, Ser. No. 692,992

Claims priority, application United Kingdom, May 30, 1990, 9012024

Int. Cl.[5] H04R *5/00*

U.S. Cl. 381—27 **14 Claims**



1. In a method of transmitting an audio signal having a left stereo component, a right stereo component and a back component using a transmitting system having left, right and mono channels, the steps of:

forming a composite mono signal by adding said left stereo component, said right stereo component and said back component;

forming a composite left signal and a composite right signal from respective differences between said left stereo component and said back component, and between said right stereo component and said back component; and

transmitting said composite mono signal, said composite left signal and said composite right signal over said mono, left and right channels, respectively.

5,181,250

NATURAL LANGUAGE GENERATION SYSTEM FOR PRODUCING NATURAL LANGUAGE INSTRUCTIONS

Jerry L. Morgan, Urbana; Alan M. Frisch, Champaign, both of Ill., and Erhard W. Hinrichs, Tuebingen, Fed. Rep. of Germany, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 27, 1991, Ser. No. 800,780

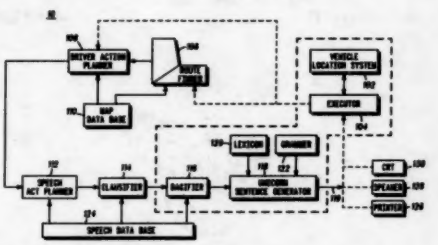
Int. Cl.[5] G10L *5/02*; G08G *1/123*; G06F *15/50*; G01C *21/00*

U.S. Cl. 381—51 **8 Claims**

1. A method of generating instructions to navigate along a route between a starting location and a desired destination location, said route being comprised of at least one road segment, a plurality of the characteristics of a plurality of road segments being known and defined in a series of data records, said method comprised of the steps of:

a) planning a speech action for a user, that describes at least one operation to be performed by the user, to traverse at least one segment between the starting location and the destination location;

b) determining which speech act, from a predetermined set of possible speech acts, is required to convey an instruction to the user to perform said at least one operation;



c) for the speech act of step b:

forming a subset of speech clauses from a set of possible speech clauses to convey said instruction;

clausifying said subset of speech clauses prior to generating an audible speech clauses:

generating an audible speech clause from said subset of speech clauses.

5,181,251

AMPLIFIER UNIT

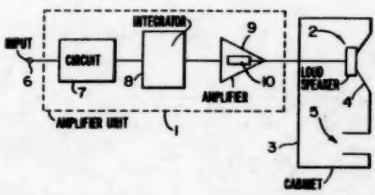
Roger Schultheiss, and Paul Zwicky, both of Dielsdorf, Switzerland, assignors to Studer Revox AG, Regensdorf, Switzerland

Filed Sep. 25, 1991, Ser. No. 765,247

Claims priority, application Switzerland, Sep. 27, 1990, 03111/90

Int. Cl.[5] H04R *3/00*

U.S. Cl. 381—96 **5 Claims**



1. An amplifier unit for driving an electrodynamic loudspeaker arranged in a cabinet along with a device which is coupled with the rear of the electrodynamic loudspeaker and which adds acoustic energy in a limited frequency range with the same polarity to that energy which is delivered form the front of the electrodynamic loudspeaker, the improvement which comprises:

the amplifier unit exhibiting a negative output impedance;

an amplifier provided for the amplifier unit;

an integrator provided for the amplifier unit;

the electrodynamic loudspeaker together with the coupled device, the amplifier and the integrator delivering an output signal exhibiting a first characteristic; and

circuit means provided for the amplifier unit for altering an input signal in accordance with a second characteristic which is at least approximately inverse to the first characteristic, wherein the amplifier exhibits a negative output impedance and is constructed such that the negative out-

put impedance is effective at least over two octaves above resonance frequency of the electrodynamic loudspeaker.

5,181,252

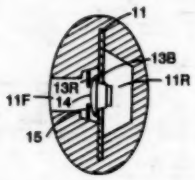
HIGH COMPLIANCE HEADPHONE DRIVING

Roman Sapiejewski, Boston, and John J. Breen, Southboro, both of Mass., assignors to Bose Corporation, Framingham, Mass.

Continuation of Ser. No. 138,095, Dec. 28, 1987, Pat. No. 4,922,542, and a continuation of Ser. No. 398,133, Aug. 23, 1989, abandoned. This application Oct. 16, 1991, Ser. No. 782,874

Int. Cl.[5] H04R *25/00, 7/00*

U.S. Cl. 381—187 6 Claims



1. A headset comprising:

at least one earcup having a front cavity and rear cavity with front cavity and rear cavity compliances respectively,

a baffle separating the front and rear cavities,

a high compliance driver with a driver compliance that is greater than said rear cavity compliance having a diaphragm joined to a voice coil normally residing in a gap mounted on the baffle, and

an active noise reduction system coupled to said driver.

5,181,253

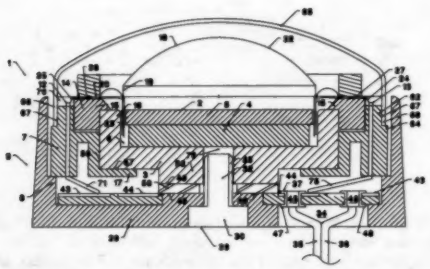
LOUDSPEAKER ASSEMBLY

Jeff B. Jordan, Baton Rouge, La., assignor to Southern Audio Services, Inc., Baton Rouge, La.

Filed Jan. 8, 1991, Ser. No. 638,696

Int. Cl.[5] H04R *25/00*

U.S. Cl. 381—199 6 Claims



1. In a loudspeaker having a yoke assembly including a top plate and a yoke fixedly attached to opposite sides of a magnet to form an air gap between said plate and said yoke into which a voice coil operatively extending from a diaphragm is positioned, said yoke affixed to a magnet base through which electrical terminals extend, one end of said terminals being operatively attached to said voice coil, said magnet base having an open end near said diaphragm and being positioned in a housing and said magnet base having a grille covering its open end, and its end opposite the open end being enclosed by a base member of said housing, the improvement to which comprises: a stud having a head member fixed to said base member and having a shaft extending upward from said base member and toward said yoke, said shaft having a threaded section and being of sufficient length to be screwed into a mating threaded opening in the center section of said yoke, and at least one passageway extending through said base member to allow electrical wire to pass for operative attachment to said electrical terminals; and wherein said base member is frictionally lockable to said yoke assembly when said threaded section is screwed into said threaded opening.

5,181,254

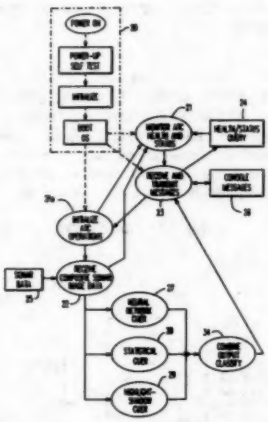
METHOD FOR AUTOMATICALLY IDENTIFYING TARGETS IN SONAR IMAGES

Philipp F. Schweizer, Monroeville, and Walter J. Petlevich, Jr., Uniontown, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 14, 1990, Ser. No. 628,116

Int. Cl.[5] G06K *9/00;* H04N *5/31;* H04B *11/00*

U.S. Cl. 382—1 5 Claims



1. A method of detecting and classifying features in a sonar image comprised of a matrix of pixels, each pixel having a known greyness level comprising the steps of:

a) defining a set of windows, each window comprised of a set of adjacent pixels such that each pixel of the image is included in at least one window;

b) thereafter for each window performing the steps of:

i) filtering each window;

ii) performing a Fourier transform of each window;

iii) scaling each window;

iv) classifying each window which has been processed under steps (i) thru (iii) as a highlight, shadow or background according to the greyness levels of the pixels in each window;

c) selecting those windows which have been classified as highlight windows and shadow windows;

d) recording a location for each selected window relative to the image; and

e) classifying a set of windows as one of a highlight cluster, a shadow cluster, a highlight ridge, a shadow trough, an anomaly and background.

5,181,255

SEGMENTATION OF HANDWRITING AND MACHINE PRINTED TEXT

Dan S. Bloomberg, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

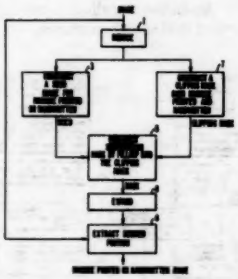
Filed Dec. 13, 1990, Ser. No. 627,284

Int. Cl.[5] G06K *9/34*

U.S. Cl. 382—9 12 Claims

1. In a digital processing means, a method of identifying handwritten annotation areas of an input image having hand-

written annotation areas and machine printed text areas comprising morphologically processing a region of said input image having a plurality of handwritten and machine printed characters to produce a destination image, said destination image identifying substantially only said machine printed text or said handwritten annotations areas, wherein said step of processing further comprises the step of identifying regions of machine printed text or handwritten annotations with a structuring element (SE) which selectively identifies said machine printed text or handwritten annotations to produce a first intermediate image, wherein the step of identifying regions further comprises the steps of:



a) closing said first intermediate image with an SE having two horizontally adjacent ON pixels to produce a second intermediate image; and

b) xoring said input image with said second intermediate image.

5,181,256

PATTERN RECOGNITION DEVICE USING A NEURAL NETWORK

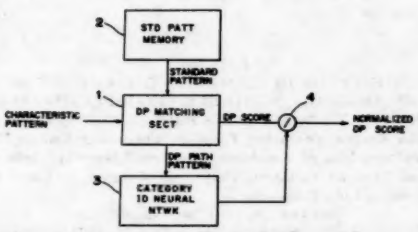
Shin Kamiya, Nara, Japan, assignor to Sharp Kabushika Kaisha, Japan

Filed Dec. 24, 1990, Ser. No. 633,302

Claims priority, application Japan, Dec. 28, 1989, 1-339957

Int. Cl.[5] G06K 9/62

U.S. Cl. 382—14 **5 Claims**



1. A pattern recognition device comprising:

a dynamic programming matching section which applies a dynamic programming matching to both a characteristic pattern which expresses characteristics of input information and a standard pattern which expresses each of multiple categories inclusive of a category to which the input information belongs, and which thereby generates a dynamic programming score expressing a total sum of distances along an optimum path and a dynamic programming path pattern expressing the optimum path as a matrix pattern;

a category identification neural network to which are input values of elements of the dynamic programming path pattern generated by the dynamic programming matching section, and which determines whether a category of the characteristic pattern and a category of the standard pattern are the same, and which outputs a determination result which expresses the degree of the determination; and

a normalized dynamic programming score generator which compensates the dynamic programming score generated by the dynamic programming matching section using the determination result output from the category identification neural network, and thus generates a normalized dynamic programming score normalizing an allowable distortion in the characteristic pattern.

5,181,257

METHOD AND APPARATUS FOR DETERMINING REGISTER DIFFERENCES FROM A MULTI-COLOR PRINTED IMAGE

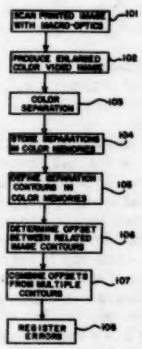
Gerd Steiner, Heusenstamm; Rudi Weniger; Rolf Braun, both of Offenbach am Main; Rainer Otterbach, Siegen; Erhard Schubert, Bad Berleburg, and Ralf Hofmann, Siegen, all of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen AG, Fed. Rep. of Germany

Filed Apr. 22, 1991, Ser. No. 689,200

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1990, 4012608

Int. Cl.[5] G06K 9/46

U.S. Cl. 382—17 **20 Claims**



1. A method of determining register differences in a multi-color printed image formed of a plurality of superimposed single-color printed images, the method comprising the steps of:

scanning at least a part of the multi-color printed image with a color video camera to produce an enlarged electronic video image of a size adequate to resolve individual dots making up the image,

processing the video image to derive a plurality of single-color images and storing the single-color images in respective color memories,

selecting a register-checking location which includes a contour in the printed image comprising at least two superimposed single-colors,

determining separation contours in the respective single-color images from the information stored in the respective color memories at the register-checking location, and

determining offsets between the separation contours as a measure of register differences between the single color images.

5,181,258

LINEAR PATTERN RECOGNIZING METHOD

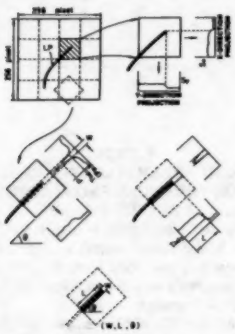
Makoto Nagao, and Keiji Terada, both of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

Filed Mar. 14, 1990, Ser. No. 465,232

Claims priority, application World Int. Prop. O., Oct. 2, 1987, PCT/JP87/00735

Int. Cl.[5] G06K *9/36*

U.S. Cl. 382—28 **24 Claims**



1. A linear pattern recognizing method comprising:

a first step in which the memory region of an original image memory in which image data have been stored is divided into a plurality of overlapping smaller subregions, and according to the image data in said plurality of smaller subregions, projection waveforms at a plurality of different projection angles are obtained for each of said smaller subregions;

a second step of obtaining, according to said projection waveforms obtained in said first step, the line direction of a linear pattern existing in the image data of each of said smaller subregions;

a third step of determining, according to said projection waveforms obtained for said smaller subregions in said first step, whether or not a linear pattern exist in the image data of each of said smaller subregions;

a fourth step of obtaining, according to said projection waveforms obtained for said smaller subregions in said first step, the line width of a linear pattern existing in the image data of each of said smaller subregions;

a fifth step of obtaining, according to said projection waveforms obtained for said smaller subregions in said first step, the line length of a linear of a pattern existing in the image data of each of said smaller subregions;

a sixth step of obtaining, according to said projection waveforms obtained for said smaller subregions in said second through fifth steps, extracting a linear segment corresponding to a linear pattern existing in the image data of each of said smaller subregions; and

a seventh step of combining said linear segments in said smaller subregions which have been extracted in said sixth step, to extract said linear pattern included in said image data.

5,181,259

GENERAL METHOD OF PATTERN CLASSIFICATION USING THE TWO DOMAIN THEORY

Mark E. Rorvig, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 25, 1990, Ser. No. 587,922

Int. Cl.[5] G06K *9/00*

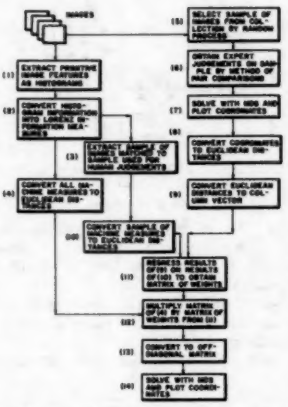
U.S. Cl. 382—36 **19 Claims**

1. A method for automatic classification of a collection C of patterns using the judgments of human experts on a plurality of sample patterns, said method comprising the steps of:

(a) selecting a set of sample patterns;

(b) manually comparing members of said set of sample patterns to determine the degree of dissimilarity of each member of said set with respect to other members of said set;

(c) producing an ordering Φ of said members of said set by their degree of dissimilarity in an n-dimensional space by means of multi-dimensional scaling to produce a real-valued ordering Φ of said sample patterns;



(d) sensing the collection C of patterns to produce a signal S representing said patterns;

(e) processing the signal S to produce a plurality of machine derived signatures representing distributions of primitive features of interest;

(f) calculating the spatial distance among pairs of said patterns from said machine derived signatures to produce a matrix M of interpoint distances; and

(g) creating a mapping of the ordering Φ on the matrix M by multiple regression;

whereby said collection of patterns is organized into sets of similar patterns.

5,181,260

METHOD FOR DETERMINING THE AMOUNT OF SKEW OF IMAGE, METHOD FOR CORRECTING THE SAME, AND IMAGE DATA PROCESSING SYSTEM

Yasuo Kurosu, Yokosuka; Yoshihiro Yokoyama; Kenichi Nishikawa, both of Yokohama; Hidefumi Masuzaki, Hadano, and Masaaki Fujinawa, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 31, 1990, Ser. No. 606,613

Claims priority, application Japan, Oct. 31, 1989, 1-284046

Int. Cl.[5] G06K *9/32*

U.S. Cl. 382—46 **11 Claims**

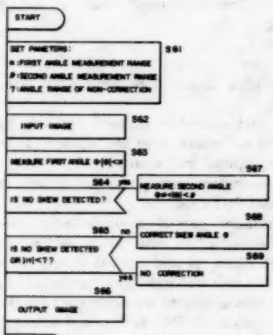
1. A method for correcting the skew of a document image with respect to a reference angle by detecting the angle of skew of an image by integrating the document image or a characteristic amount of the document image in a plurality of radial directions and by discriminating as to the direction in which the resultant value of integration thereof is peak, the method comprising the steps of:

(a) performing first an integrating and discriminating operations for a narrow range of angles including the reference angle;

(b) performing next the integrating and discriminating operations for a range of angles wider than that of said narrow range only when no angle of skew of the document is

obtained by the integrating and discriminating operations for the narrow range;

(c) performing correction of the skew of the image in accordance with the angle of skew obtained in either step (a) or step (b); and

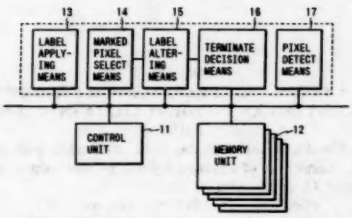


(d) omitting correction of the skew of the image when the angle of skew is not obtained with respect to the integrating and discriminating operations in steps (a) or (b).

5,181,261
AN IMAGE PROCESSING APPARATUS FOR DETECTING THE BOUNDARY OF AN OBJECT DISPLAYED IN DIGITAL IMAGE

Takashi Nagao, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1990, Ser. No. 628,954
Claims priority, application Japan, Dec. 20, 1989, 1-330235
Int. Cl.[5] G06K *9/20*
U.S. Cl. 382—48 **18 Claims**



1. A method for processing an image composed of pixels having actual values, the image picturing an object having a boundary, the method comprising the steps of:

designating a group of pixels, the designated group of pixels including the pixels which form the image of the object;

labeling the pixels in the designated group of pixels with label values;

marking one of the pixels in the designated group; and

altering the label value of the marked pixel, the altered label value being dependent upon the actual value and the label value of the marked pixel and the actual value and the label value of at least one other pixel;

wherein the step of altering the label value of the marked pixel comprises the sub-steps of:

selecting more than one pixel other than the marked pixel as reference pixels;

comparing the actual values of the reference pixels with the actual value of the marked pixel;

selecting the reference pixel with an actual value closest to the actual value of the marked pixel as a closest reference pixel;

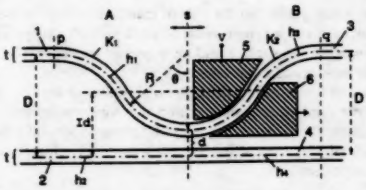
averaging the label value of the marked pixel with the label value of the closest reference pixel to obtain an average value; and

changing the label value of the marked pixel to the average value.

5,181,262
DIGITAL OPTICAL SWITCH

Johannes J. Gerardus, Zoetermeer, and Doeke K. Doeksen, Haarlem, both of Netherlands, assignors to Koninklijke Ptt Nederland N.V., Groningen, Netherlands

Filed May 10, 1991, Ser. No. 698,444
Claims priority, application Netherlands, May 17, 1990, 9001157
Int. Cl.[5] G02B *6/26, 6/42*
U.S. Cl. 385—16 **9 Claims**



1. Digital optical switch comprising:

a first section, hereinafter called the input section, having a first incoming optical wave guide and a second incoming optical wave guide, which optical wave guides have a mutually approaching path up to a point within their interaction region,

a second section, hereinafter called the output section, having a third outgoing optical wave guide and a fourth outgoing optical wave guide, which optical wave guides have a mutually receding path up to a point outside their interaction region, the optical wave guides of the output section connecting to those of the input section, and

first means for controllably influencing the light propagation state in at least one of the optical wave guides in one of said sections, the optical wave guides both in the input section and in the output section mutually exhibiting, in their light propagation state, an asymmetry which is controllable by said first means at least in one of said sections, therefore called the switching section, characterized in that

the optical wave guides of the input section incorporate a first converging curve which brings said first and second optical wave guides within each other's interaction region,

and in that the optical wave guides of the output section incorporate a first diverging curve which brings the third and fourth optical wave guides outside each other's interaction region,

the asymmetry essentially being achieved, at least in the section which is not the switching section, by that one of said first curves which is incorporated therein.

5,181,263
WAVE-GUIDE I/O FOR OPTICAL OR ELECTRO-OPTICAL COMPONENTS

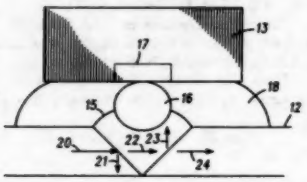
Dennis Derfiny, Clarendon Hills, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 526,207, May 21, 1990, abandoned. This application Jun. 7, 1991, Ser. No. 711,606
Int. Cl.[5] G02B *6/28*
U.S. Cl. 385—24 **8 Claims**

1. An apparatus for exchanging a communicated optical

signal between an optical information bus and an electro-optical component, such apparatus comprising:

A) a flat surface, for diverting at a substantially predetermined angle at least a portion of an optical signal between an axis of transmission within a waveguide of the optical information bus and an axis of transmission of the optical component, disposed on the wave-guide at substantially a forty-five degree angle to the axis of transmission within



the wave-guide and the axis of transmission of the component, with a polymer resin at least partially disposed between the flat surface and an object of transmission on the electro-optical component;

B) means for focusing the optical signal with respect to the electro-optical component and the waveguide; and

C) means for maintaining a predetermined spatial relationship of the means for focusing and the electro-optical component.

5,181,264

TRANSCEIVER FOR BIDIRECTIONAL SIGNAL TRANSMISSION OVER A MONOMODAL OPTICAL FIBER

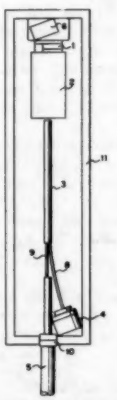
Guido Chiaretti, Novate Milanese, and Francesco Blandano, Corbetta, both of Italy, assignors to Italtel Societa Italiana Telecomunicazioni S.p.A., Milan, Italy

Filed Jun. 21, 1991, Ser. No. 731,147

Claims priority, application Italy, Dec. 22, 1988, 23056 A/88

Int. Cl.[5] G02B *6/32*; G02F *1/00*; B31B *1/60*

U.S. Cl. 385—33 **11 Claims**



1. An optical transceiver for receiving and transmitting information optically over a single optical communication fiber, comprising:

a housing;

a light transmitter disposed in said housing for emitting a first wavelength of light for transmission over the optical communication fiber;

a light receiver disposed in said housing for receiving a second wavelength of light from the single optical communication fiber; and

an optical system disposed in said housing for directing the first wavelength of light from said light transmitter to the single optical communication fiber and for directing the second wavelength of light from the single optical communication fiber to said light receiver, said optical system including,

a first lens,

a second lens,

a planar filter disposed between said first and second lenses,

said first and second lenses each having a first face confronting said planar filter and a second face for communicating optical information;

said light transmitter being positioned in front of the second face of said first lens;

wherein a terminal part of the single optical communication fiber is connected to said optical system and an optical fiber stub connects said optical system to said light receiver, such that said light transmitter, said light receiver, and said optical system are connected via the single optical communication fiber within said housing;

said optical fiber stud and the single optical communication fiber being mounted on a support in juxtaposition with the second face of said second lens, thereby constraining the positions of said light transmitter, said light receiver, and said optical system with respect to each other, within said housing.

10. A method of affixing a monomodal optical fiber to an optical system for use in an optical transmission system wherein said optical system has a planar lens communicating via said monomodal optical fiber, comprising;

providing a grooved support adjacent said planar lens as part of said optical system;

abutting said monomodal optical fiber against said planar lens to locate it is a first dimension;

locating said monomodal optical fiber in second and third dimensions by positioning said monomodal optical fiber within the groove of said grooved support; and

gluing said monomodal optical fiber into position.

5,181,265

OPTICAL COUPLING APPARATUS FOR INTRODUCING AND COUPLING AN INCIDENT LIGHT INTO A WAVE GUIDE

Seiji Nishiwaki; Shinji Uchida, both of Osaka, and Junichi Asada, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 26, 1991, Ser. No. 675,527

Claims priority, application Japan, Mar. 26, 1990, 2-76030; Jul. 9, 1990, 2-180807

Int. Cl.[5] G02B *6/32*

U.S. Cl. 385—33 **14 Claims**

1. An optical coupling apparatus comprising:

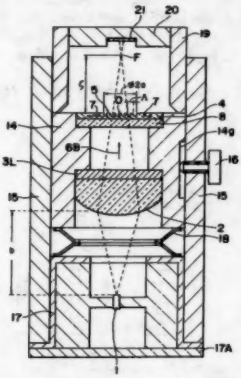
a laser source which emits a divergent beam of laser light in a direction along an optical axis of the apparatus;

a wave guide lying in a plane perpendicular to the optical axis;

a photocoupler provided on said wave guide and having a concentric periodic structure;

optical means for introducing the laser light from said laser source to said photocoupler as a polarized beam of light having a spherical wavefront, said optical means including polarization converting means for converting the laser light emitted from said laser source to a polarized beam, the electric field vectors of which are equal at positions diagonally across from each other with respect to a circle centered at said optical axis; and

said photocoupler being arranged at such a position relative to said laser source that the polarized beam incident on the



waveguide is coupled to waveguided light with maximum efficiency.

5,181,266

FIBER OPTICAL WAVEGUIDE HAVING AN ELECTRICALLY CONDUCTIVE CONNECTION

Hermann Brennecke, Darmstadt/Eberstadt, and Horst Liere, Eppertshausen, both of Fed. Rep. of Germany, assignors to Alfo AG, Muntelier, Switzerland

Filed Mar. 11, 1992, Ser. No. 849,260

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1991, 4110279

Int. Cl.[5] G02B *6/44*

U.S. Cl. 385—78 **13 Claims**

1. A fiber optical wave guide having a bundle (4) including a plurality of optical fibers (1) spaced apart locally with connection fittings (2) at opposite ends of said bundle, a filler of an electrical connection material (3) is in electrical contact with at least a portion of each of said plurality of fibers for dissipating electrical charges entering by diffusion, and a protective sheath surrounds said bundle of fibers and extends along a length of said bundle between said connection fittings.

5,181,267

SHEATH CONNECTOR FOR AN OPTICAL CABLE

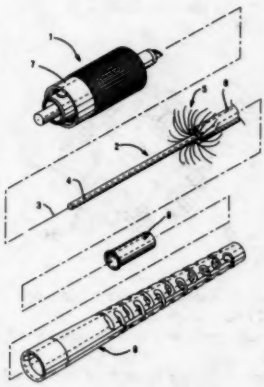
Jeffrey T. Gerace; Alan E. Plotts, both of Harrisburg, and Frederic H. Abendschein, Columbia, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 450,330, Dec. 13, 1989, Pat. No. 5,096,276, which is a continuation-in-part of Ser. No. 159,151, Feb. 23, 1988, abandoned. This application Mar. 16, 1992, Ser. No. 851,456

Int. Cl.[5] G02B *6/36*

U.S. Cl. 385—86 **8 Claims**

1. A connector for an optical fiber cable, comprising: a shell adapted to be secure to a load bearing portion of a fiber optic cable, a holder for an optical fiber of the fiber optic cable adapted to be secured by adhesive to the optical fiber, the holder being mounted to the shell for relative displacement therewith, a sheath extending rearwardly from the holder and toward a rear of the shell, the sheath being adapted to be



displaced along the shell upon displacement of the holder relative to the shell, and the sheath being adapted to encircle a buffer covered portion of the optical fiber and to prevent adhesive from leaking from the holder to an inside of the shell.

5,181,268

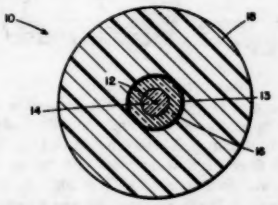
STRIPPABLE TIGHT BUFFERED OPTICAL WAVEGUIDE FIBER

Ching-Kee Chien, Horseheads, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Aug. 12, 1991, Ser. No. 743,763

Int. Cl.[5] G02B *6/22*

U.S. Cl. 385—128 **23 Claims**



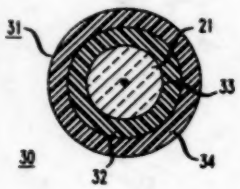
1. A tight buffered optical waveguide fiber comprising:
(a) an optical waveguide fiber;
(b) a first protective coating surrounding and in contact with the external surface of the optical waveguide fiber;
(c) an interfacial layer surrounding and in contact with the external surface of the first protective coating, said layer comprising a solid lubricant and a film-forming binder; and
(d) a second protective coating surrounding and in contact with the external surface of the interfacial layer.

5,181,269

OPTICAL FIBER INCLUDING ACIDIC COATING SYSTEM

James R. Petisce, Norcross, Ga., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 17, 1991, Ser. No. 761,135
Int. Cl.[5] G02B 6/22
U.S. Cl. 385—128 16 Claims



1. A coated optical fiber having enhanced strength, said coated optical fiber comprising:

an optical glass portion which includes a core and a cladding; and

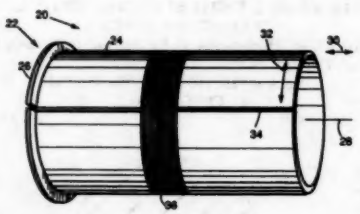
a coating system which is disposed about and which has a portion thereof in engagement with said cladding, the coating system including at least one layer which comprises a material which causes the optical glass portion to be contacted by an environment which is sufficiently acidic to enhance the strength of the coated optical fiber.

5,181,270

OPTICAL FIBER CANISTER

Hui-Pin Hsu, Northridge, and Ronald B. Chesler, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 9, 1991, Ser. No. 742,815
Int. Cl.[5] G02B 6/16
U.S. Cl. 385—134 12 Claims



1. An optical fiber canister, comprising:

a bobbin formed in the shape of a frustoconical shell having a pair of spaced-apart ends and a longitudinal axis extending through said shell between said ends;

an optical fiber pack wound on said frustoconical shell, wherein said frustoconical shell is constructed of a material having a coefficient of thermal expansion closely matching the coefficient of thermal expansion of said optical fiber pack in a direction parallel to said longitudinal axis; and

a slot extending the entire length of said frustoconical shell between said spaced-apart ends, said slot extending completely through a wall of said shell;

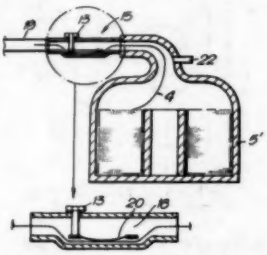
whereby said slot allows said frustoconical shell to expand and contract circumferentially at the same rate as the optical fiber pack expands and contracts in the circumferential direction.

5,181,271

OPTICAL FIBER STORAGE SYSTEM AND METHOD OF INSTALLING OPTICAL FIBER USING SAME

Peter D. Jenkins, Woodbridge, England, assignor to British Telecommunications public limited company, Great Britain

Filed Sep. 18, 1991, Ser. No. 768,425
Claims priority, application United Kingdom, Mar. 23, 1989, 8906765
Int. Cl.[5] G02B 6/02; B65H 59/00, 18/28
U.S. Cl. 385—135 15 Claims



1. An optical fibre storage system comprising a container having turns of optical fibre wound within it in a substantially helical formation, the diameters of the turns and the container being such that the turns of the fibre are maintained in position by their natural resilience pressing them outwardly against the inside of the container.

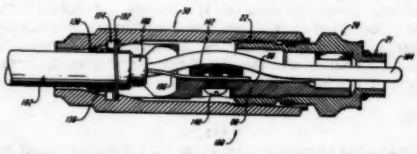
11. A method of installing an optical fibre member into a previously-installed duct, the method comprising the steps of connecting a container of fibre to the previously-installed duct, via a blowing apparatus, and providing a gas-tight seal therebetween, introducing a supply of propellant gas directly into the blowing apparatus at a point intermediate the container and the duct, and initiating advance of the fibre member solely as the result of viscous drag forces caused by the flow of the propellant gas past the fibre member, the rate of advance of the fibre member in the duct being substantially less than the flow velocity of the propellant gas in the duct.

5,181,272

FIBER OPTIC CABLE ENTRY CONNECTOR

Scott R. Hopper, Redmond, Wash., assignor to Augat Communications Group Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 541,618, Jun. 21, 1990, Pat. No. 5,074,636. This application Sep. 12, 1991, Ser. No. 758,740
Int. Cl.[5] G02B 6/36
U.S. Cl. 385—139 18 Claims



1. A fiber optic cable entry connector for integrating a fiber optic cable having an external jacket and strengthening member to a housing, comprising:

a housing having first and second matable members each defining when mated together an enclosed channel for allowing optic fibers to be passed from the external jacket to the trunk housing;

said first housing member having means for engagement to the trunk housing, an opening for allowing optic fibers to be channeled to the trunk housing, and means for releasably mating with said second housing member;

said second housing member having means for releasably

mating with said first housing member and an opening for receiving the jacketed cable; and

a clamp assembly enclosed at least partially within said defined channel and having ends, means disposed intermediate said ends for securing the cable strengthening member, and means disposed on one of said ends and cooperative with said second housing member for clamping the jacketed cable within said channel and at a location near said second housing member opening.

5,181,273

ELECTRONIC APPARATUS HAVING A CALENDAR-DISPLAY FUNCTION

Yuji Ohtani, Urawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 369,694, Jun. 21, 1989, abandoned. This application Apr. 12, 1991, Ser. No. 685,160

Claims priority, application Japan, Jul. 7, 1988, 63-90085[U]

Int. Cl.[5] **G06F** *15/40*

U.S. Cl. 395—161 **13 Claims**

1. A small sized electronic apparatus comprising:

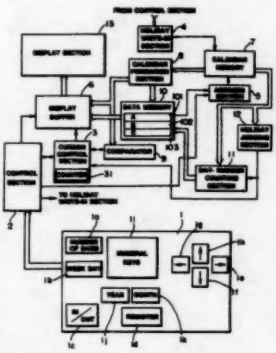
displaying means including a liquid crystal display device of a dot-matrix type for displaying a calendar of at least one month;

cursor display means for displaying a cursor in order to indicate an arbitrary one date on the displayed calendar;

key input means including at least one user operated cursor key for enabling a user to move the cursor on the displayed calendar by operation of said at least one cursor key;

designating means, responsive to an operation of said at least one cursor key of said key input means, for designating a first date which represents a start point for day number counting;

counting means for counting a number of days between said first date and a second date indicated by the cursor each



time said at least one cursor key is operated after designating said first date to indicate the second date on the displayed calendar;

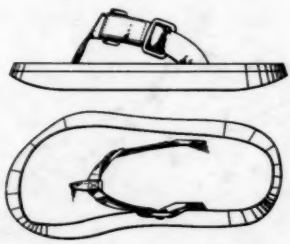
display means for displaying the number of days counted by said counting means.

DESIGNS

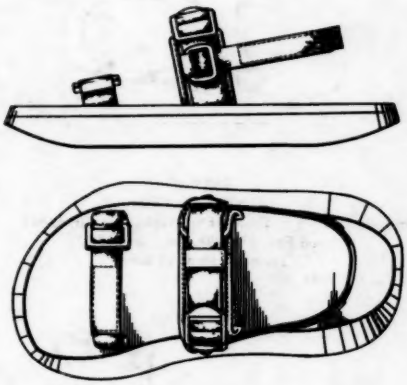
JANUARY 19, 1993

332,514
COMBINED VEST AND HEATING ELEMENT
Norman H. Brandoff, 353 Windsor Park La., Havertown, Pa. 19083
Filed Aug. 14, 1990, Ser. No. 567,343
Term of patent 14 years
U.S. Cl. D2—184

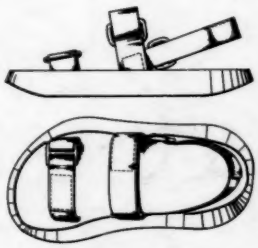
332,515
ADJUSTABLE THONG SANDAL
Scott D. Middleton, Edmonton, Canada, assignor to Kix International, Inc., Edmonton, Canada
Filed Mar. 21, 1991, Ser. No. 673,110
Term of patent 14 years
U.S. Cl. D2—270



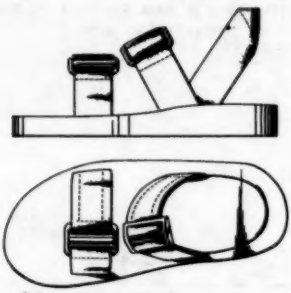
332,516
ADJUSTABLE DOUBLE STRAP SANDAL
Scott D. Middleton, Edmonton, Canada, assignor to Kix International, Inc., Edmonton, Canada
Filed Mar. 21, 1991, Ser. No. 673,109
Term of patent 14 years
U.S. Cl. D2—290



332,517
TOE STRAP SANDAL
Scott D. Middleton, Edmonton, Canada, assignor to Kix International, Inc., Edmonton, Canada
Filed Aug. 13, 1991, Ser. No. 745,057
Term of patent 14 years
U.S. Cl. D2—290



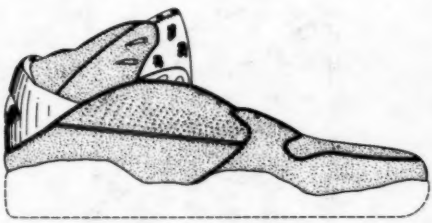
332,518
ADJUSTABLE SPORT SANDAL
Scott D. Middleton, Edmonton, Canada, assignor to Kix International, Inc., Edmonton, Canada
Filed Aug. 13, 1991, Ser. No. 745,095
Term of patent 14 years
U.S. Cl. D2—290



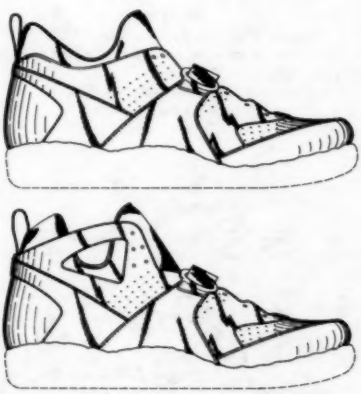
332,519
SHOE HEATER
Alan Nelson, 1795 E. Fremont St., Galesburg, Ill. 61401
Filed Feb. 22, 1991, Ser. No. 659,157
Term of patent 14 years
U.S. Cl. D2—314

332,520
ELEMENTS OF A SHOE UPPER
Christopher Kittle, Cohasset, Mass., assignor to Reebok International Ltd., Stoughton, Mass.
Division of Ser. No. 530,734, May 30, 1990, Pat. No. No. Des. 327,769. This application Sep. 27, 1991, Ser. No. 767,925
Term of patent 14 years
U.S. Cl. D2—314

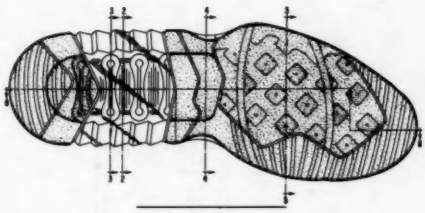
332,521
SHOE UPPER
Steven C. McDonald, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Dec. 13, 1991, Ser. No. 806,425
Term of patent 14 years
U.S. Cl. D2—314



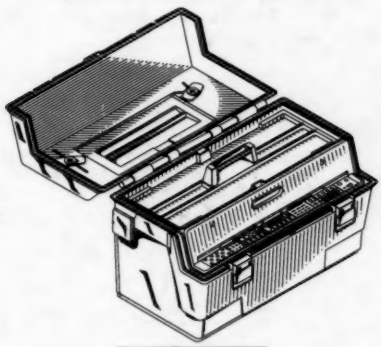
332,522
SHOE UPPER
Tinker L. Hatfield, Portland, and Wilson W. Smith, Beaverton, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed May 7, 1992, Ser. No. 879,356
Term of patent 14 years
U.S. Cl. D2—314



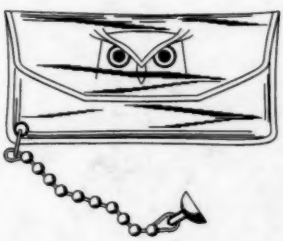
332,523
SHOE SOLE BOTTOM
Tinker Hatfield, Portland, and Sergio Lozano, Beaverton, both of Oreg., assignors to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Jun. 25, 1991, Ser. No. 721,207
Term of patent 14 years
U.S. Cl. D2—320



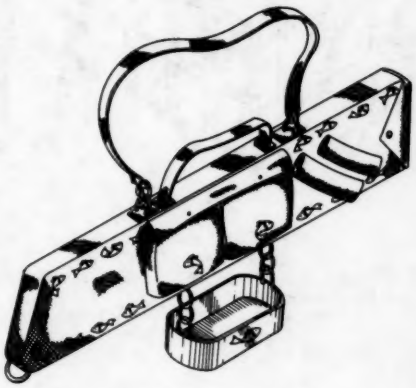
332,524
TOOL BOX
Larry R. Gray; Gerald F. Slocum, both of Danville, Va.; Donald C. Andrus, High Point, N.C., and James E. Edgell, Roanoke, Va., assignors to The Disston Company, Greensboro, N.C.
Filed Aug. 10, 1989, Ser. No. 392,039
Term of patent 14 years
U.S. Cl. D3—30.1



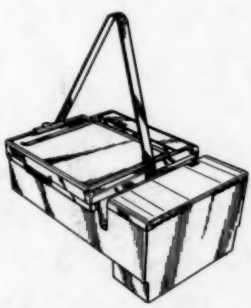
332,525
SPECTACLE CASE
Ryan S. Ogata, 1337 W. 187th Pl., Gardena, Calif. 90248
Filed Dec. 20, 1990, Ser. No. 631,062
Term of patent 14 years
U.S. Cl. D3—34



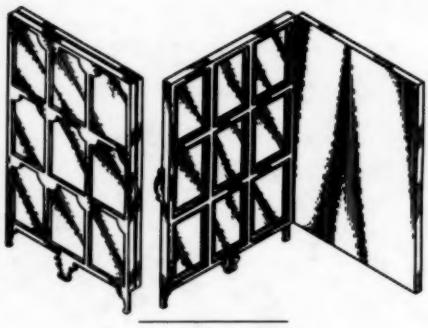
332,526
FISHING TACKLE CASE
Willie M. Bowman, Rte. 2 Box 196, Ozark, Ala. 36360
Filed Sep. 28, 1990, Ser. No. 589,896
Term of patent 14 years
U.S. Cl. D3—38



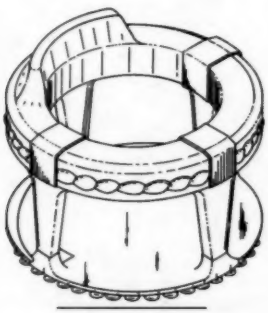
332,527
AUTOMOBILE DESK
Michael J. Szablak, Wooster, Ohio, and Glen E. Tomblin, Winchester, Va., assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 13, 1990, Ser. No. 552,210
Term of patent 14 years
U.S. Cl. D3—40



332,528
PICTURE FRAME
Ralph Neal, P.O. Box 37, Woodland, Ga. 31836
Filed Jul. 25, 1990, Ser. No. 557,664
Term of patent 14 years
U.S. Cl. D6—301

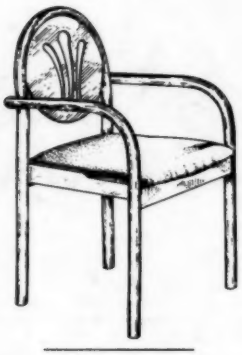


332,529
BATHING SEAT
Eric T. Shuler, Orchard Park, N.Y., assignor to Fisher-Price, Inc., East Aurora, N.Y.
Filed Sep. 14, 1989, Ser. No. 407,459
Term of patent 14 years
U.S. Cl. D6—333

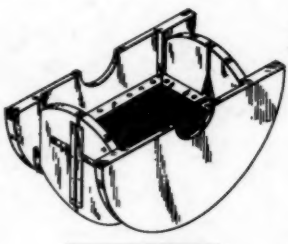


332,530
CHAIR
Chuong Q. B. Nguyen, 2522 Lance La., Stafford, Tex. 77477
Filed Nov. 2, 1989, Ser. No. 432,146
Term of patent 14 years
U.S. Cl. D6—370

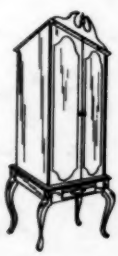
332,531
CHAIR
Silvano Guion, Manzano, Italy, assignor to Fratelli Billiani S.R.L., Manzano, Italy
Filed Feb. 13, 1990, Ser. No. 448,562
Claims priority, application Italy, Oct. 23, 1989, 60441 B/89
Term of patent 14 years
U.S. Cl. D6—379



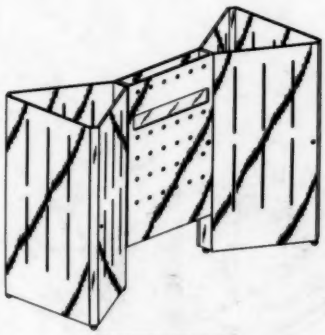
332,532
CRADLE
Mary A. Combs, 12328 W. Grand Place, Morrison, Colo. 80465
Filed Oct. 16, 1990, Ser. No. 598,346
Term of patent 14 years
U.S. Cl. D6—385



332,533
ENTERTAINMENT CENTER
Mark Ma, 1415 Martens Dr., Hammond, La. 70401
Filed Mar. 16, 1990, Ser. No. 494,484
Term of patent 14 years
U.S. Cl. D6—446



332,534
LIGHTING FIXTURE DISPLAY STAND
Michael P. Alford, Huntington Beach, Calif., assignor to Minka Lighting, Inc., Corona, Calif.
Filed Jul. 16, 1990, Ser. No. 553,951
Term of patent 14 years
U.S. Cl. D6—469



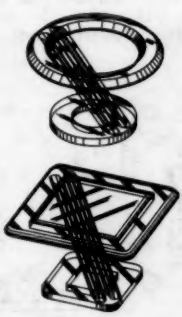
332,535
TABLE
Isao Hosoe, Milan, Italy, assignor to Itoki Co., Ltd., Osaka, Japan
Filed Dec. 21, 1990, Ser. No. 631,779
Claims priority, application Japan, Aug. 29, 1990, 2-28734
Term of patent 14 years
U.S. Cl. D6—482

332,536
TABLE
Isao Hosoe, Milan, Italy, assignor to 501 Itoki Co., Ltd., Osaka, Japan
Filed Dec. 21, 1990, Ser. No. 631,791
Claims priority, application Japan, Aug. 29, 1990, 2-28731
Term of patent 14 years
U.S. Cl. D6—482

332,537
TABLE
Isao Hosoe, Milan, Italy, assignor to 501 Itoki Co., Ltd., Osaka, Japan
Filed Dec. 21, 1990, Ser. No. 631,792
Claims priority, application Japan, Aug. 29, 1990, 2-28732
Term of patent 14 years
U.S. Cl. D6—482

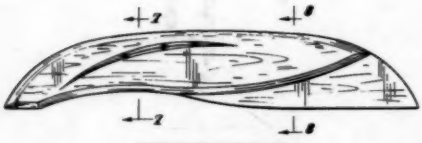
332,538
TABLE
Isao Hosoe, Milan, Italy, assignor to Itoki Co. Ltd., Osaka, Japan
Filed Dec. 21, 1990, Ser. No. 631,793
Claims priority, application Japan, Aug. 29, 1990, 2-28733
Term of patent 14 years
U.S. Cl. D6—482

332,539
PEDESTAL
Mikhail Loznikov, 2007 Balboa St., San Francisco, Calif. 94121
Filed Jul. 20, 1990, Ser. No. 555,996
Term of patent 14 years
U.S. Cl. D6—495

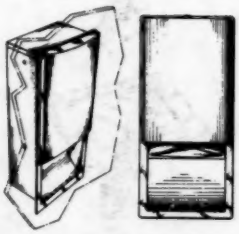


332,540
MOTORCYCLE BACKREST AND REAR ARTICLE CARRIER
John C. Peterson, 2004 Esquiline, Walnut, Calif. 91789
Filed Feb. 5, 1991, Ser. No. 651,486
Term of patent 14 years
U.S. Cl. D6—502

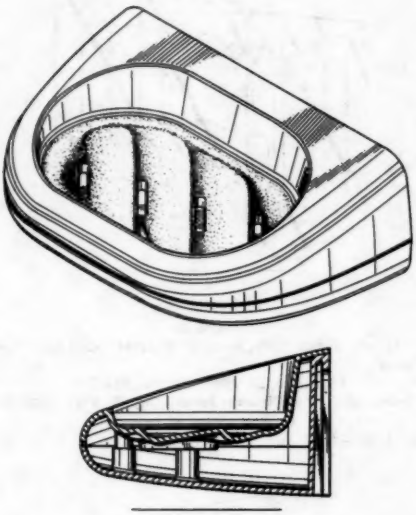
332,541
END CAP FOR A CRIB
Keith Williams, Salem, Ind., assignor to Child Craft Industries, Inc., Salem, Ind.
Filed Aug. 31, 1990, Ser. No. 575,998
Term of patent 14 years
U.S. Cl. D6—503



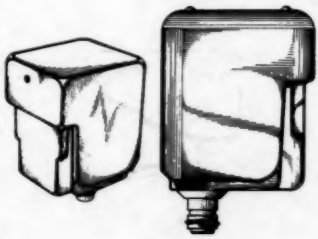
332,542
TOWEL DISPENSER
David M. Hines, Santa Ana, Calif., assignor to Bobrick Washroom Equipment, Inc., North Hollywood, Calif.
Filed Nov. 15, 1991, Ser. No. 792,775
Term of patent 14 years
U.S. Cl. D6—518



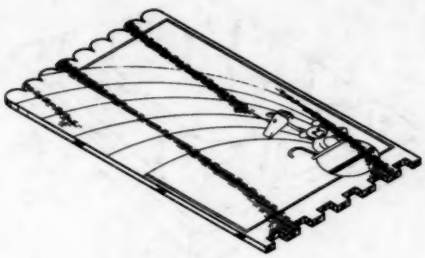
332,543
WALL-MOUNTED SOAP DISH
Gregory M. Crook, Columbus, and Kent W. Murphy, Wooster, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed May 25, 1990, Ser. No. 528,776
Term of patent 14 years
U.S. Cl. D6—545



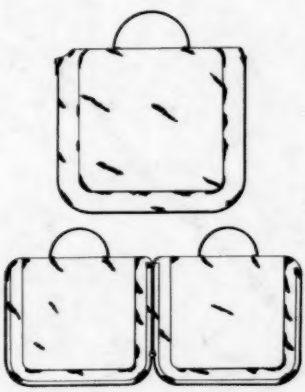
332,544
RESERVOIR FOR A LIQUID SOAP DISPENSER
Robert L. Steiner; Charles R. Holzner, both of Chicago, and Allen J. Voth, Oak Park, all of Ill., assignors to Steiner Company, Inc., Chicago, Ill.
Filed May 8, 1991, Ser. No. 697,282
Term of patent 14 years
U.S. Cl. D6—545



332,545
CUSHION INSERT FOR A BABY CRIB
Doreen M. VanderVelden, A6346 147th Ave., Holland, Mich. 49423
Filed Sep. 26, 1990, Ser. No. 588,217
Term of patent 14 years
U.S. Cl. D6—596



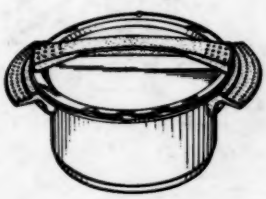
332,546
COMBINED STADIUM BAG AND SEAT
Thomas E. Waltner, 999 Garfield, Carbondale, Colo. 81623
Filed Aug. 3, 1989, Ser. No. 389,102
Term of patent 14 years
U.S. Cl. D6—601



332,547
DRINKING STRAW
Erik Lipson, Philadelphia, Pa., assignor to Sansom, Inc., Philadelphia, Pa.
Filed Jun. 4, 1991, Ser. No. 694,842
Term of patent 14 years
U.S. Cl. D7—300.2

332,548
STRAW
Richard D. Mayatt, Rte. 2 Box 401-1, Collinsville, Miss. 39325
Filed Oct. 7, 1991, Ser. No. 782,272
Term of patent 14 years
U.S. Cl. D7—300.2

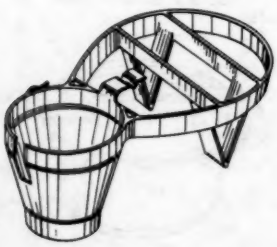
332,549
COVERED COOKING VESSEL
Thomas Gerlach, Altensteig, Fed. Rep. of Germany, assignor to Fissler GmbH, Idar-Oberstein, Fed. Rep. of Germany
Filed Feb. 2, 1990, Ser. No. 473,709
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1989, M8905411.3
The portion of the term of this patent subsequent to Sep. 22, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—360



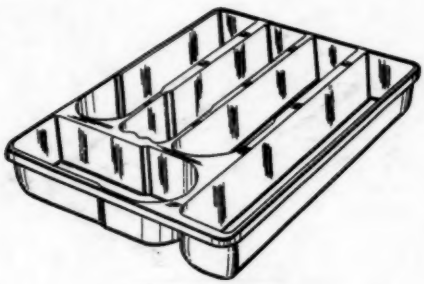
332,550
BEVERAGE CONTAINER HOLDER
David Maynerd, 16 Nanogate Rd., Cavershami, RG4 7PN, and Simon King, Flat 6, The Glange, 12 Sydenham Hill, London, SE26 6SJ, both of England
Filed Apr. 20, 1990, Ser. No. 511,513
Claims priority, application United Kingdom, Oct. 24, 1989, 2001917
Term of patent 14 years
U.S. Cl. D7—619

332,551
HOLDER FOR INVERTED BOTTLES
Jan Fields, 11689 Rosehill, Overland Park, Kans. 66210, and Ed Stout, 10590 S. Haskins, Overland Park, Kans. 66215
Filed Sep. 21, 1990, Ser. No. 585,371
Term of patent 14 years
U.S. Cl. D7—619

332,552
COMBINED CUP AND PLATE HOLDER
C. Richard Lynch, 3666 S. Acoma St. #101, Englewood, Colo. 80110
Filed Apr. 26, 1991, Ser. No. 692,080
Term of patent 14 years
U.S. Cl. D7—619



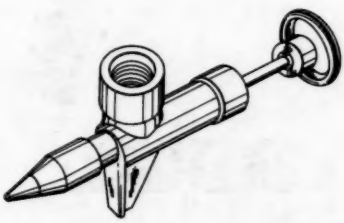
332,553
CUTLERY BOX
Giorgetto Giugiaro, Turin, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Feb. 5, 1991, Ser. No. 650,646
Claims priority, application Italy, Aug. 8, 1990, 21635 B/90
Term of patent 14 years
U.S. Cl. D7—637



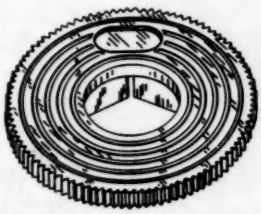
332,554
COMBINED KITCHEN AND BARBECUE UTENSILS
Leonard J. Gomez, and Juanita M. Gomez, both of 2628 E. Rose Ave., Orange, Calif. 92667
Filed Apr. 16, 1991, Ser. No. 686,257
Term of patent 14 years
U.S. Cl. D7—685

332,555
GARDENING SHOVEL
Oscar V. Hagerman, R.R. 1 Box 185, Mount Olive, Ill. 62069
Filed Mar. 27, 1991, Ser. No. 675,704
Term of patent 14 years
U.S. Cl. D8—10

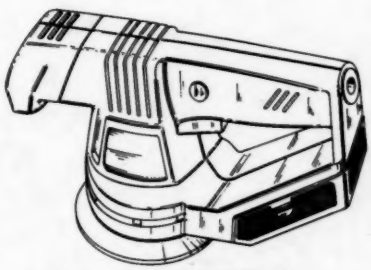
332,556
GREASE GUN
Phil A. Snider, Hicksvile, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.
Filed Oct. 18, 1990, Ser. No. 601,081
Term of patent 14 years
U.S. Cl. D8—14.1



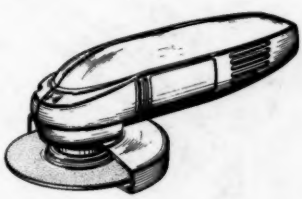
332,557
RATCHET SPINNER
Jonathan D. Blake, Shrewsbury, and Vincent A. Piucci, Jr., Spencer, both of Mass., assignors to Textron Inc., Providence, R.I.
Filed Mar. 13, 1991, Ser. No. 668,442
Term of patent 14 years
U.S. Cl. D8—29



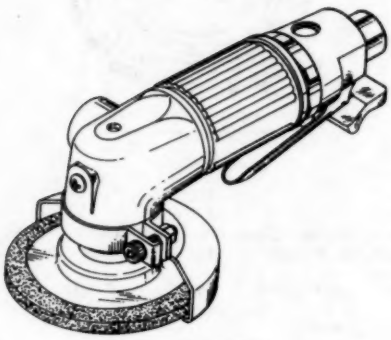
332,558
SANDER
Kiyoshi Hoshino, Clemson, S.C., and James B. Watson, Conyers, Ga., assignors to Ryobi Motor Products Corp., Easley, S.C.
Filed Aug. 9, 1990, Ser. No. 565,323
Term of patent 14 years
U.S. Cl. D8—62



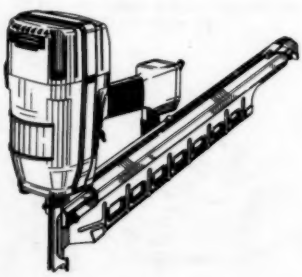
332,559
PORTABLE ELECTRIC GRINDER
Hiroaki Miyoshi, and Nobuhiro Sano, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Dec. 4, 1990, Ser. No. 624,904
Claims priority, application Japan, Jun. 5, 1990, 2-18939
Term of patent 14 years
U.S. Cl. D8—62



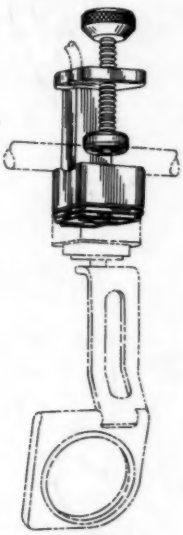
332,560
PORTABLE DISK GRINDER
Toshio Mikiya, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan
Filed Dec. 26, 1990, Ser. No. 634,347
Term of patent 14 years
U.S. Cl. D8—62



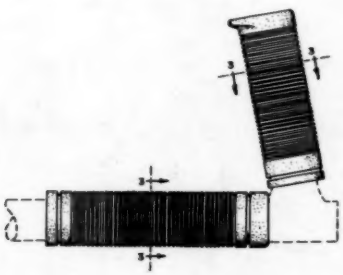
332,561
NAIL GUN
Fusao Fushiya; Akira Mizumoto, and Kenji Mukoyama, all of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Jul. 11, 1990, Ser. No. 550,890
Claims priority, application Japan, Oct. 12, 1989, 1-37331
Term of patent 14 years
U.S. Cl. D8—69



332,562
COMBINED SUPPORT CLAMP AND ELECTRICAL RECEPTACLE
Robert S. Fremont, Deerfield, and Gary P. Wereley, Wheaton, both of Ill., assignors to Juno Lighting, Inc., Des Plaines, Ill.
Filed Feb. 19, 1991, Ser. No. 657,541
Term of patent 14 years
U.S. Cl. D8—73

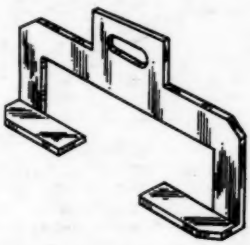


332,563
PAIR OF BICYCLE HANDLEBAR GRIPS
Jeffry L. Lurkis, 7726 Willow Glen Rd., Los Angeles, Calif. 90046
Filed Oct. 22, 1991, Ser. No. 781,935
Term of patent 14 years
U.S. Cl. D8—303



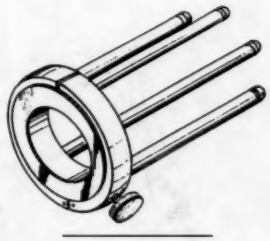
332,564
DOOR HANDLE
Joseph R. Santosuosso, Chatsworth, Calif., assignor to Anthony's Manufacturing Company, Inc., San Fernando, Calif.
Filed Feb. 5, 1991, Ser. No. 650,725
Term of patent 14 years
U.S. Cl. D8—314

332,565
DRAWER GUIDE REINFORCER BRACKET
Bobby J. Allred, High Point, N.C., assignor to Allied Metal Stamping Works, High Point, N.C.
Filed Apr. 5, 1991, Ser. No. 681,167
Term of patent 14 years
U.S. Cl. D8—354

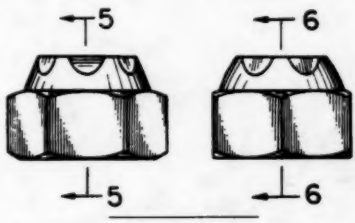


332,566
FESTOON HOLDER
Stanley Kleiman, 15 Parson Pl., Colonia, N.J. 07067
Filed Jan. 23, 1991, Ser. No. 650,716
Term of patent 14 years
U.S. Cl. D8—368

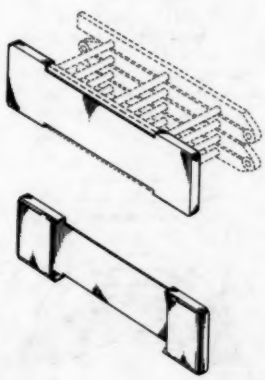
332,567
PIPE FITTER'S TOOL
Vanus L. Taylor, Rte. 3, Box 171-M, Seale, Ala. 36875
Filed Nov. 19, 1990, Ser. No. 615,638
Term of patent 14 years
U.S. Cl. D8—396



332,568
LOCK NUT
Kunihiko Ozawa, 39-6 Tsurukawa 4-chome, Machida-shi, Tokyo, Japan
Filed Feb. 1, 1990, Ser. No. 472,575
Claims priority, application Japan, Nov. 16, 1989, 1-41685
Term of patent 14 years
U.S. Cl. D8—397

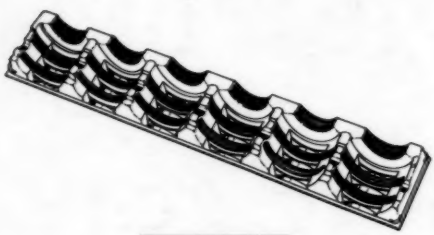


332,569
PACKAGING CARTON FOR A LADDER
Robert J. Noble, Jr., 42 Plum St., Greenville, Pa. 16125
Filed Nov. 22, 1989, Ser. No. 440,734
Term of patent 14 years
U.S. Cl. D9—418

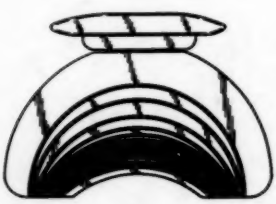


332,570
HANDLE FOR SPRAY BOTTLE
Paolo Tiramani, Greenwich, Conn., and Thomas Van Dyk, Prospect Park, N.J., assignors to Goody Products, Inc., Kearney, N.J.
Filed Jan. 28, 1991, Ser. No. 646,985
Term of patent 14 years
U.S. Cl. D9—434

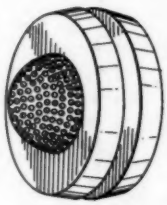
332,571
MOLDED DUNNAGE FOR FLUORESCENT TUBES
David E. Creaden, Lawrence, Kans., assignor to The Lawrence Paper Company, Lawrence, Kans.
Filed Aug. 16, 1990, Ser. No. 567,678
Term of patent 14 years
U.S. Cl. D9—456



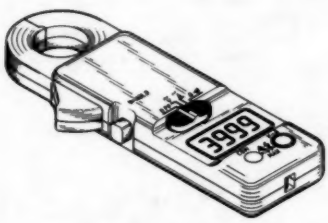
332,572
PERFUME BOTTLE
Pierre Dinand, Lavallois-Perret, France, assignor to Fox Fragrances S.r.l., Milan, Italy
Filed Apr. 5, 1989, Ser. No. 334,015
Claims priority, application Italy, Oct. 13, 1988, 22010/88[U]
Term of patent 14 years
U.S. Cl. D9—520



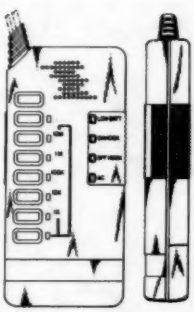
332,573
MEASURING LINE SPOOL HOUSING FOR USE IN GOLF
Lawrence G. Shekell, Box 357, R.D. 1, Champion, Pa. 15622
Filed Jun. 28, 1991, Ser. No. 723,517
Term of patent 14 years
U.S. Cl. D10—74



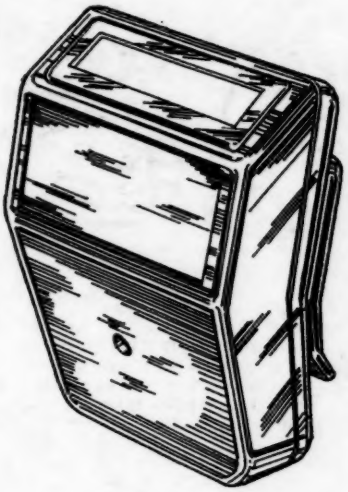
332,574
CLAMP MULTIMETER
Shang-Wen Chang, Taipei Hsien, Taiwan, assignor to APPA Technology Corporation, Taiwan
Filed Feb. 15, 1991, Ser. No. 655,979
Term of patent 14 years
U.S. Cl. D10—78



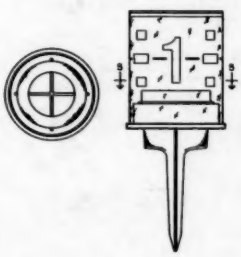
332,575
ELECTRONIC TEST SET FOR TELECOMMUNICATIONS, ALARM SYSTEM, AND CIRCUIT TESTING
John M. Redfield, Brier; David M. Rollins, Monroe; Clay A. Stocklin, Redmond; Wayne R. Fukahara, Seattle, and Denis M. Stack, Bothell, all of Wash., assignors to Leviton Manufacturing Corporation, Bothell, Wash.
Filed Aug. 29, 1991, Ser. No. 751,692
Term of patent 14 years
U.S. Cl. D10—78



332,576
PEDOMETER
Hing-Wah Huen, Kowloon, Hong Kong, assignor to Fairform Mfg. Co. Ltd., Kowloon, Hong Kong
Filed Aug. 23, 1990, Ser. No. 572,097
Term of patent 14 years
U.S. Cl. D10—98



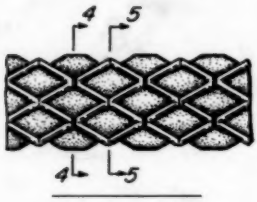
332,577
WATER GAUGE
George W. Peterson, 9235 Pioneers Ct., Lincoln, Nebr. 68520
Filed Sep. 17, 1990, Ser. No. 583,675
Term of patent 14 years
U.S. Cl. D10—101



332,578
INFLATABLE DISTRESS BALLOON KIT
Dennis H. Gibson, 409 Arlington Rd., Newton Falls, Ohio 44444
Filed Jun. 14, 1991, Ser. No. 715,232
Term of patent 14 years
U.S. Cl. D10—109

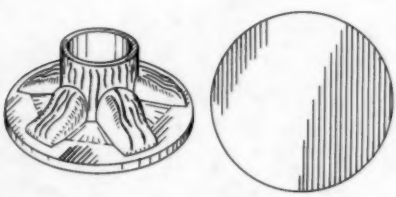
332,579
MEASURING SPOON
Sarah A. Goldman, 1 Rue Montreux, Newport Beach, Calif. 92660
Filed Jul. 15, 1991, Ser. No. 729,803
Term of patent 14 years
U.S. Cl. D10—46.2

332,580
JEWELRY CHAIN
Xavier Rousseau, Paris, France, assignor to Societe Nouvelle Chaumet S.A., Paris, France
Filed Jan. 24, 1990, Ser. No. 476,272
Term of patent 14 years
U.S. Cl. D11—12



332,581
HALLOWEEN JACK-O'-LANTERN DECORATION
Neal N. Mankey, Charlotte, N.C., assignor to Allied Plastics, Ltd., Gastonia, N.C.
Filed Jun. 7, 1991, Ser. No. 711,739
Term of patent 14 years
U.S. Cl. D11—121

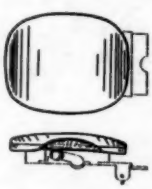
332,582
CHRISTMAS TREE STAND
James D. Quinn, 8528 Benbow Merrill Rd., Oak Ridge, N.C. 27310
Filed Apr. 11, 1991, Ser. No. 683,674
Term of patent 14 years
U.S. Cl. D11—130.1



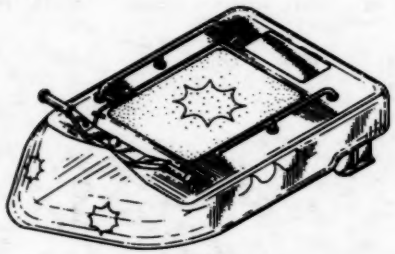
332,583
VASE
Robert D. Jones, 1452 N. Washington, Ardmore, Okla. 73401, and James O. Easley, 1908 Willow Way Cir., Edmond, Okla. 73034
Filed Feb. 12, 1991, Ser. No. 654,562
Term of patent 14 years
U.S. Cl. D11—149

332,584
ORNAMENT HANGER
Dorothy Tarro, 7812 Rhonda Dr., Roscoe, Ill. 61073
Filed Aug. 29, 1990, Ser. No. 574,249
Term of patent 14 years
U.S. Cl. D11—164

332,585
BELT BUCKLE COVER
Craig W. Olson, P.O. Box 302, Fontana on Geneva Lake, Wis. 53125
Filed Jul. 13, 1989, Ser. No. 379,540
Term of patent 14 years
U.S. Cl. D11—201

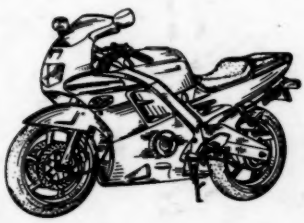


332,586
TOWED WATERSLED
Leslie L. Jones, 12 Joe Nestor Rd., Tijeras, N. Mex. 87059
Filed Sep. 19, 1990, Ser. No. 584,892
Term of patent 14 years
U.S. Cl. D12—6



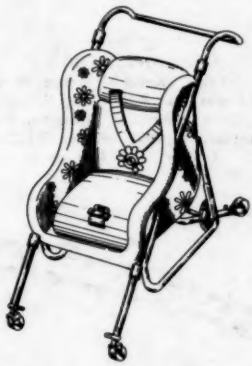
332,587
AUTOMOBILE
Douglas Halbert, San Pedro; Dave W. Marek, Hollywood, and Masakazu Udagawa, Rancho Palos Verdes, all of Calif., assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 20, 1990, Ser. No. 541,420
Term of patent 14 years
U.S. Cl. D12—91

332,588
MOTORCYCLE
Mitsuyoshi Kohama, Kawagoe; Nobuyuki Kyogoku, Higashimurayama, and Seiji Yamaguchi, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 24, 1991, Ser. No. 646,019
Claims priority, application Japan, Aug. 31, 1990, 2-29303
Term of patent 14 years
U.S. Cl. D12—110



332,589
MOTORCYCLE CHILD SAFETY BELT
Jay K. Frank, 82 Old Sambro Rd., Halifax, Nova Scotia, CN B3R-1R2, Canada
Filed Feb. 4, 1991, Ser. No. 650,426
Term of patent 14 years
U.S. Cl. D12—114

332,590
COMBINED CAR SEAT AND STROLLER
Calvin R. Robinson, Rte. 2 Box 88, Lorman, Miss. 39096
Filed Feb. 2, 1990, Ser. No. 473,853
Term of patent 14 years
U.S. Cl. D12—129

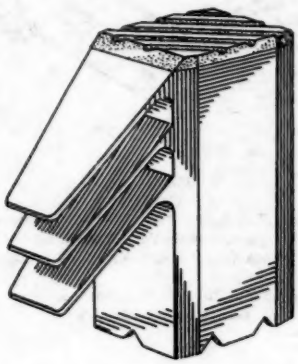


332,591
INFANT STROLLER
Blaine T. Reely, 1109 Briar Creek Rd., Enid, Okla. 73703
Filed Jul. 5, 1990, Ser. No. 548,740
Term of patent 14 years
U.S. Cl. D12—129

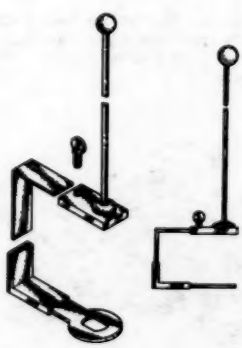
332,592
STROLLER
Michael D. O'Dea, Miami, and Margaret Nelson, Dania, both of Fla., assignors to Wheels and Things, Inc., Dania, Fla.
Filed Feb. 19, 1991, Ser. No. 657,196
Term of patent 14 years
U.S. Cl. D12—129

332,593
WINDSHIELD WIPER
Joe Gerardiello, Newton; Samuel M. Seltzer, Bernardsville; Ed Bryant, Succasunna, and John Gage, Hazlet, all of N.J., assignors to Allison Corporation, Livingston, N.J.
Filed Aug. 12, 1991, Ser. No. 744,021
Term of patent 14 years
U.S. Cl. D12—155

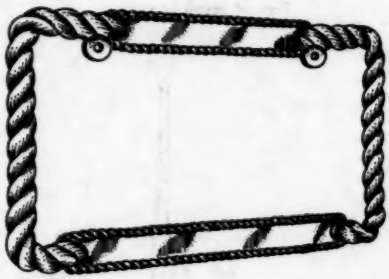
332,594
SKI RETENTION POST FOR MAINTAINING PAIRS OF SKIS IN PRESSURE RETENTION CONTACT ACROSS A PAIR OF ROOF MOUNTED SKI RACKS
Michel Dallaire; Michael Santella, and Michel Swift, all of Montreal, Canada, assignors to 167848 Canada Inc., Granby, Canada
Filed Apr. 16, 1990, Ser. No. 509,497
Claims priority, application Canada, Feb. 13, 1990, 13-02-90-18
Term of patent 14 years
U.S. Cl. D12—157



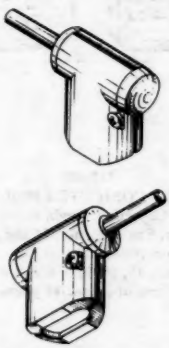
332,595
TRAILER HITCH GUIDE
Cleven E. Randolph, 2100 Hazel St., Lynchburg, Va. 24504
Filed Mar. 7, 1991, Ser. No. 741,152
Term of patent 14 years
U.S. Cl. D12—162



332,596
ROPE LICENSE PLATE FRAME
John L. Corey, 17700 S. Avalon Blvd. #55, Carson, Calif. 90746
Filed Nov. 5, 1990, Ser. No. 610,261
Term of patent 14 years
U.S. Cl. D12—193

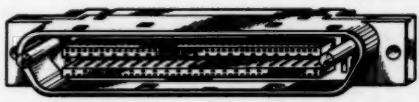


332,597
LOUDSPEAKER CONNECTOR PLUG
Martin J. Dalgleish, Glasgow, Scotland, assignor to Linn Products Limited, Glasgow, Scotland
Filed Jan. 18, 1991, Ser. No. 643,660
Claims priority, application United Kingdom, Jul. 19, 1990, 2008390
Term of patent 14 years
U.S. Cl. D13—133

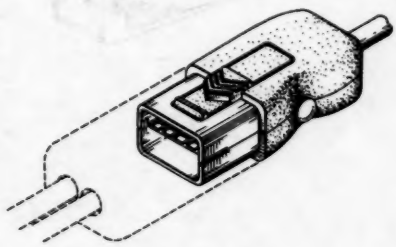


332,598
ELECTRICAL CONNECTOR
Shigeru Kikuta, and Yoshikazu Hirata, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan
Filed Mar. 18, 1991, Ser. No. 670,774
Claims priority, application Japan, Sep. 17, 1990, 2-30895
Term of patent 14 years
U.S. Cl. D13—147

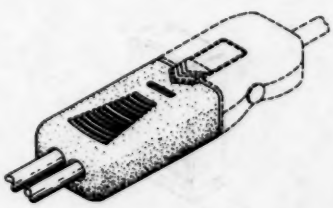
332,599
ELECTRICAL CONNECTOR
Shigeru Kikuta, and Yoshikazu Hirata, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan
Filed Mar. 18, 1991, Ser. No. 670,775
Claims priority, application Japan, Sep. 17, 1990, 2-30894
Term of patent 14 years
U.S. Cl. D13—147



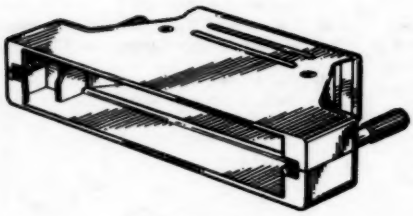
332,600
ELECTRICAL CONNECTOR FOR A COMMUNICATION HEADSET SYSTEM
Robert E. Lucey, Sudbury, and Robert M. Kelly, Burlington, both of Mass., assignors to Unex Corporation, Chelmsford, Mass.
Filed Sep. 9, 1991, Ser. No. 756,376
Term of patent 14 years
U.S. Cl. D13—147



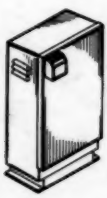
332,601
ELECTRICAL CONNECTOR FOR A COMMUNICATION HEADSET SYSTEM
Robert E. Lucey, Sudbury, and Robert M. Kelly, Burlington, both of Mass., assignors to Unex Corporation, Chelmsford, Mass.
Filed Sep. 9, 1991, Ser. No. 756,377
Term of patent 14 years
U.S. Cl. D13—147



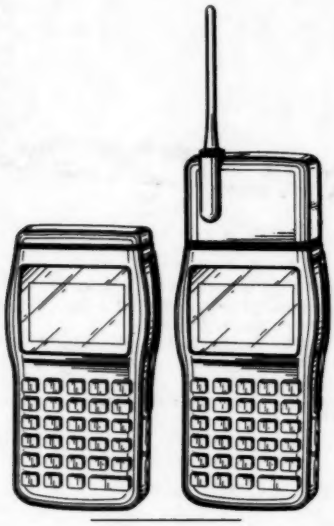
332,602
ELECTRICAL CONNECTOR COVER CASE
Shigeru Kikuta, and Yoshikazu Hirata, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan
Filed Mar. 18, 1991, Ser. No. 670,773
Claims priority, application Japan, Sep. 17, 1990, 2-30896
Term of patent 14 years
U.S. Cl. D13—154



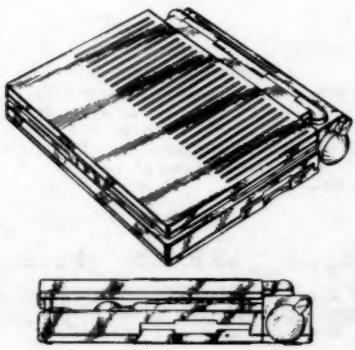
332,603
ELECTRICAL CONTROL BOX
Wayne A. Rumbles, 16526 Cotuit Cir., Huntington Beach, Calif. 92649
Filed Feb. 5, 1991, Ser. No. 650,670
Term of patent 14 years
U.S. Cl. D13—184



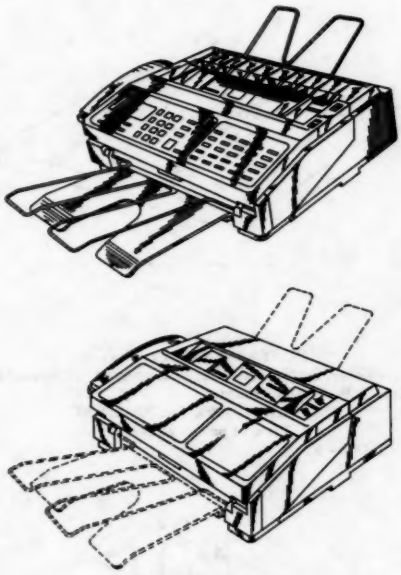
332,604
COMPUTER INPUT AND OUTPUT TERMINAL
Takao Miyake; Masayoshi Kawaishi, and Katsuhiro Ishida, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 1, 1991, Ser. No. 677,978
Claims priority, application Japan, Oct. 4, 1990, 2-33702; Oct. 4, 1990, 2-33703; Oct. 4, 1990, 2-33709
Term of patent 14 years
U.S. Cl. D14—100



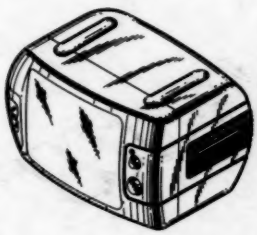
332,605
LAPTOP COMPUTER HOUSING
Jonathan Krakower, Cupertino; Gavin R. Ivester, Palo Alto, and Robert D. Brunner, San Jose, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed Dec. 18, 1990, Ser. No. 629,355
Term of patent 14 years
U.S. Cl. D14—106



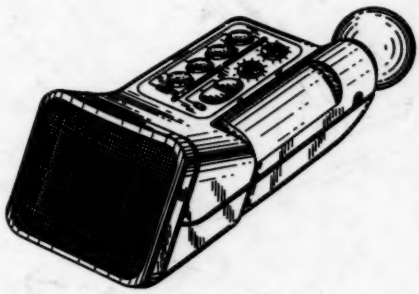
332,606
FACSIMILE MACHINE
Akiyoshi Tanizawa, Osaka, and Yuji Abe, Yamstotakada, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed Jan. 9, 1991, Ser. No. 638,510
Claims priority, application Japan, Jul. 9, 1990, 2-23312
Term of patent 14 years
U.S. Cl. D14—118



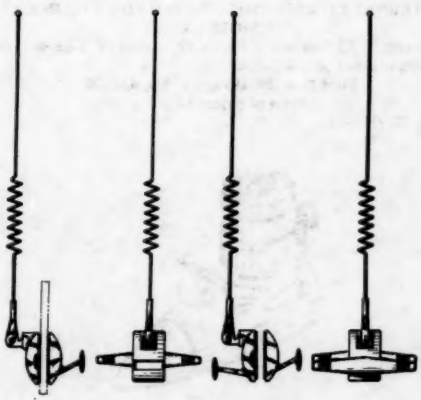
332,607
SPEAKER BOX WITH BUILT IN AMPLIFIER
Akira Yamazaki, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jul. 31, 1990, Ser. No. 560,332
Claims priority, application Japan, Feb. 9, 1990, 2-3815
Term of patent 14 years
U.S. Cl. D14—210



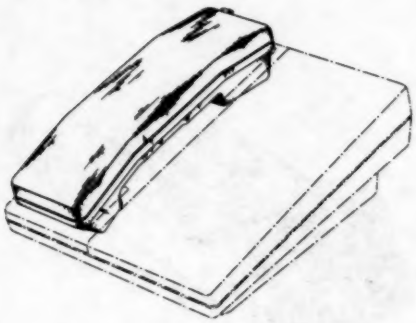
332,608
COMBINED MICROPHONE, SPEAKER AND AMPLIFIER
Yoshihiro Masagaki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jul. 31, 1990, Ser. No. 560,330
Claims priority, application Japan, Feb. 5, 1990, 2-3187
Term of patent 14 years
U.S. Cl. D14—226

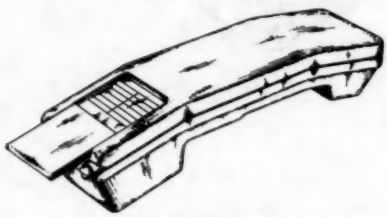


332,609
CELLULAR ANTENNA
Gershon N. Cooper, Encino, Calif., assignor to Alliance Research Corporation, Chatsworth, Calif.
Filed Nov. 27, 1990, Ser. No. 618,837
Term of patent 14 years
U.S. Cl. D14—234

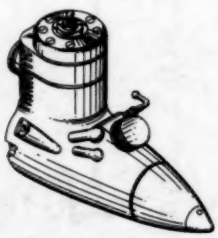


332,610
TELEPHONE HANDSET OR SIMILAR ARTICLE
Sonia Alim, Middletown; Richard M. Joffe, Teaneck; Charles F. Liebler, Holmdel, all of N.J.; John N. McGarvey, Drexel Hill, Pa., and Joseph J. Rizzo, Cliffwood Beach, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Mar. 22, 1991, Ser. No. 674,721
Term of patent 14 years
U.S. Cl. D14—252

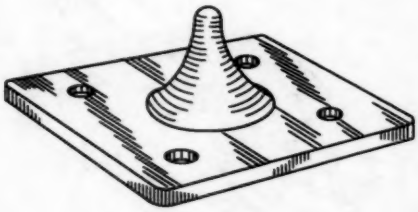




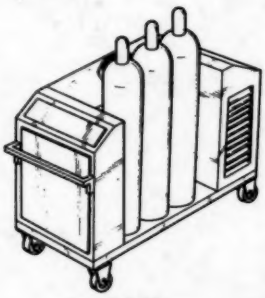
332,611
INTERNAL COMBUSTION ENGINE FOR TECHNICAL MODELS
Alexandr A. Tikhonenko, g. Engels 19, kvartal IV, 2-85, 413119, Saratovskaya obl., U.S.S.R.
Filed Nov. 29, 1990, Ser. No. 620,320
Term of patent 14 years
U.S. Cl. D15—1



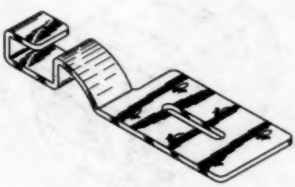
332,612
ENGINE AIR INTAKE VORTEX PLATE
Kenneth F. Klus, 34191 Camino Capistrano, Capistrano Beach, Calif. 92624
Continuation of Ser. No. 637,763, Jan. 4, 1991, abandoned. This application Feb. 18, 1992, Ser. No. 836,608
Term of patent 14 years
U.S. Cl. D15—5



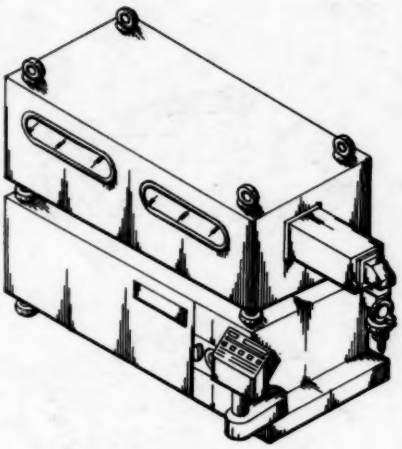
332,613
PORTABLE SPRAY UNIT
Silvano Keller, Bottstein, Switzerland, assignor to Plasma Technik AG, Wohlen, Switzerland
Filed Oct. 11, 1990, Ser. No. 596,897
Term of patent 14 years
U.S. Cl. D15—9



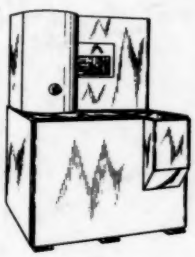
332,614
SEAM GUIDE
Gary L. Lindsay, 4 Hudson St., Taylors, S.C. 29687
Filed Jun. 15, 1990, Ser. No. 538,476
Term of patent 14 years
U.S. Cl. D15—78



332,615
LASER PROCESSING MACHINE
Chih-Han Fang; Ydu-Jia Ju, and James Wei, all of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan
Filed Jan. 19, 1990, Ser. No. 468,953
Term of patent 14 years
U.S. Cl. D15—122



332,616
ELECTRONIC MICROSCOPE
Kazunori Hashimoto, Tachikaw; Tadashi Otaka, and Minoru Shimizu, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 24, 1990, Ser. No. 556,576
Claims priority, application Japan, Jan. 26, 1990, 2-1898
Term of patent 14 years
U.S. Cl. D16—131

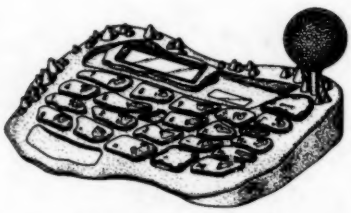


332,617
ELECTRONIC TYPEWRITER
Seiichi Omino, Kawaguchi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 25, 1991, Ser. No. 765,117
Claims priority, application Japan, Apr. 3, 1991, 3-9475
Term of patent 14 years
U.S. Cl. D18—1

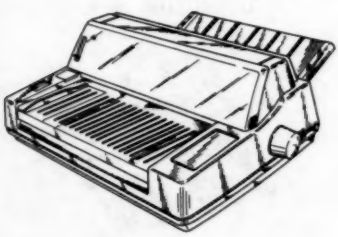
332,618
ELECTRONIC TYPEWRITER
Seiichi Omino, Kawaguchi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 27, 1991, Ser. No. 766,153
Claims priority, application Japan, Apr. 3, 1991, 3-9476
Term of patent 14 years
U.S. Cl. D18—1

332,619
ELECTRONIC TYPEWRITER
Hidero Matsumoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 4, 1991, Ser. No. 771,251
Claims priority, application Japan, Apr. 11, 1991, 3-10573
Term of patent 14 years
U.S. Cl. D8—1

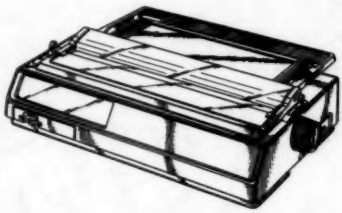
332,620
CALCULATOR
William H. K. Chu, No. 106, Wan-Shun Liau, Shen-Keng Hsiang, Taipei, Taiwan
Filed Jul. 15, 1991, Ser. No. 730,296
Term of patent 14 years
U.S. Cl. D18—7

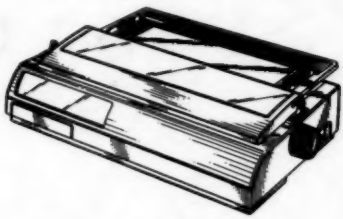


332,621
PRINTER
Koki Sugawara, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Oct. 22, 1990, Ser. No. 600,807
Claims priority, application Japan, Oct. 5, 1990, 2-33435
Term of patent 14 years
U.S. Cl. D18—55

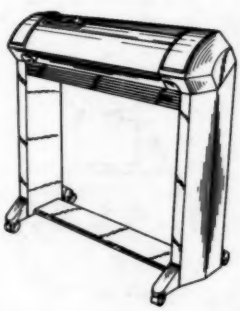


332,622
PRINTER
Kazuo Yoshida, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 166,310, Mar. 10, 1988, abandoned, and a continuation-in-part of Ser. No. 317,667, Mar. 1, 1989, abandoned. This application Dec. 28, 1990, Ser. No. 635,320
Claims priority, application Japan, Sep. 14, 1987, 62-37242; Sep. 6, 1988, 63-34932
Term of patent 14 years
U.S. Cl. D18—55

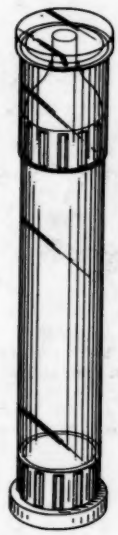




332,623
PRINTER
Tetsuya Iwanaga, Tokyo, Japan, assignor to Mutoh Industries, Ltd., Tokyo, Japan
Filed Sep. 6, 1990, Ser. No. 578,311
Claims priority, application Japan, Mar. 29, 1990, 2-10654
Term of patent 14 years
U.S. Cl. D18—52



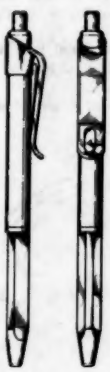
332,624
REFILLABLE DISPENSER FOR FLUIDS
JoAnn Hollowood, 4612 Ringgold La., Plano, Tex. 75093
Filed Jul. 20, 1990, Ser. No. 555,149
Term of patent 14 years
U.S. Cl. D19—43



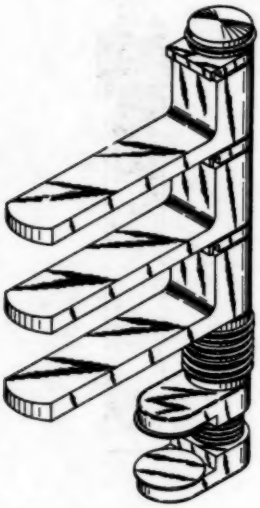
332,625
COMBINED BALL-POINT PEN AND KEY RING
John LaPerche, 67 Sedgwick Ave., Yonkers, N.Y. 10705
Filed Jun. 3, 1991, Ser. No. 709,398
Term of patent 14 years
U.S. Cl. D19—44

332,626
WRITING INSTRUMENT
Yoshihiro Wada; Takashi Tamura, both of Yashio, and Hiroshi Hasegawa, Ishioka, all of Japan, assignors to Pentel Kabushiki Kaisha, Japan
Filed Dec. 11, 1990, Ser. No. 626,701
Term of patent 14 years
U.S. Cl. D19—48

332,627
WRITING INSTRUMENT
Por Anavil, and Julian M. H. Deeley, both of Bangkok, Thailand, assignors to D.T.C. Industries Limited, Thailand
Filed Jan. 19, 1989, Ser. No. 300,052
Term of patent 14 years
U.S. Cl. D19—49



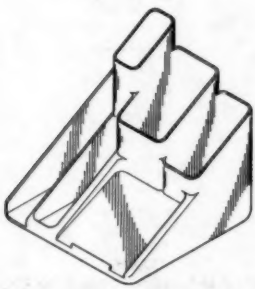
332,628
SURFACE-MOUNTABLE HOLDER FOR A PLURALITY OF DESK TRAYS
Bernd Brüssing, Uml/Donau, Fed. Rep. of Germany, assignor to Hans Friedrich Hefendehl, Kierspe, Fed. Rep. of Germany
Filed Sep. 28, 1990, Ser. No. 590,285
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1990, M 90 02 640.3
Term of patent 14 years
U.S. Cl. D19—65



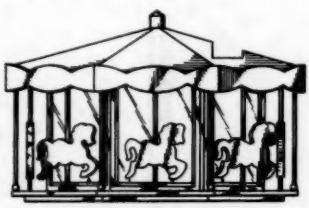
332,629
TAPE DISPENSER
Suk J. OH, Seoul, Rep. of Korea, assignor to STC Corporation, Seoul, Rep. of Korea
Filed Jul. 17, 1990, Ser. No. 553,277
Claims priority, application Rep. of Korea, Feb. 12, 1990, 90-1553
Term of patent 14 years
U.S. Cl. D19—69

332,630
DESK ACCESSORY HOLDER
Bernd Brüssing, Ulm/Donau, Fed. Rep. of Germany, assignor to Hans Friedrich Hefendehl, Kierspe, Fed. Rep. of Germany
Filed Jun. 5, 1990, Ser. No. 533,660
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1989, M 89 08 661.9
Term of patent 14 years
U.S. Cl. D19—77

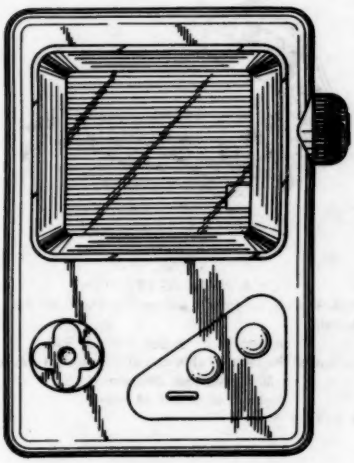
332,631
DESK CADDY
Gerald Klodt, Madison, Wis., assignor to W. T. Rogers Company, Madison, Wis.
Filed Jul. 25, 1991, Ser. No. 745,130
Term of patent 14 years
U.S. Cl. D19—78



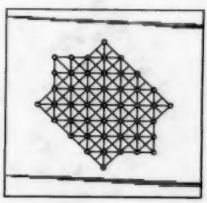
332,632
CARD HOLDER
Evelyn Camasi, R.D. #1 Walker St., Meadville, Pa. 16335
Filed Jul. 15, 1991, Ser. No. 729,806
Term of patent 14 years
U.S. Cl. D19—90



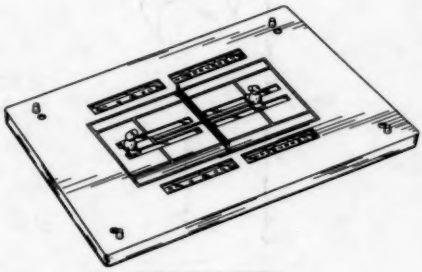
332,633
ELECTRONIC GAME HOUSING
Shizuka Kojima, Tokyo, Japan, assignor to Tomy Company, Ltd., Tokyo, Japan
Filed Jul. 31, 1991, Ser. No. 738,297
Claims priority, application Japan, Feb. 1, 1991, 3-2513
Term of patent 14 years
U.S. Cl. D21—13



332,634
GAME
Mario H. S. Marino, Buenos Aires, Argentina, assignor to C.E.P.A.D. Centro De Proyectos Avanzados De Diseno S.R.L., Buenos Aires, Argentina
Filed Mar. 7, 1990, Ser. No. 489,656
Claims priority, application Argentina, Sep. 8, 1989, 55.495
Term of patent 14 years
U.S. Cl. D21—20



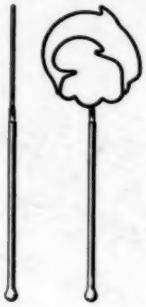
332,635
TENNIS GAME BOARD
Wilhelm Merken, TilsiterWeg 34, 5830 Schwelm, Fed. Rep. of Germany
Filed Aug. 3, 1990, Ser. No. 562,152
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1990, 9000846
Term of patent 14 years
U.S. Cl. D21—27



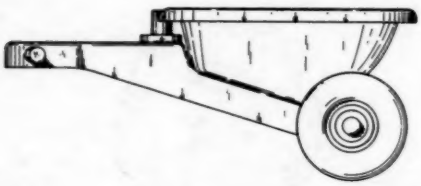
332,636
GAME BOARD
Donald J. Cole, P.O. Box 4124, Bullfrog, Lake Powell, Utah 84533
Filed Jan. 4, 1991, Ser. No. 637,520
Term of patent 14 years
U.S. Cl. D21—31

332,637
MARKING PEN FOR USE IN MARKING GAME CARDS
Mark S. Hesse, 142 Irving St. #1, Everett, Mass. 02149
Filed Sep. 11, 1990, Ser. No. 580,622
Term of patent 14 years
U.S. Cl. D21—51

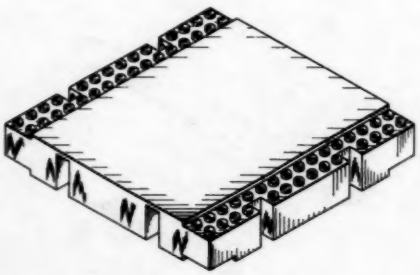
332,638
BUBBLE WAND
Margaret A. B. Neuroth, and Richard L. Neuroth, both of R.R. 1, Box 178-A, Epworth, Iowa 52045
Filed Jul. 30, 1991, Ser. No. 738,274
Term of patent 14 years
U.S. Cl. D21—61



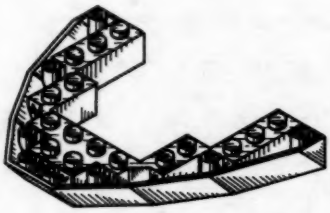
332,639
TOY TRAILER
Augusto Argandona, and Michael B. Kelly, both of East Aurora, N.Y., assignors to Fisher-Price, Inc., East Aurora, N.Y.
Filed Jun. 7, 1991, Ser. No. 711,741
Term of patent 14 years
U.S. Cl. D21—81



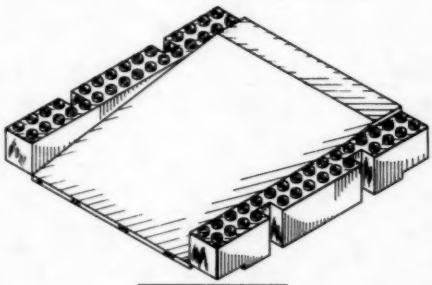
332,640
TOY BUILDING ELEMENT
Kim Pagel, Vandel, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,926
The portion of the term of this patent subsequent to Jan. 19, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—108



332,641
TOY CONSTRUCTION ELEMENT
Ib T. Skov, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,945
The portion of the term of this patent subsequent to Mar. 10, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—108

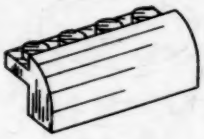


332,642
TOY BUILDING ELEMENT
Kim Pagel, Vandel, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,956
The portion of the term of this patent subsequent to Jan. 19, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—108

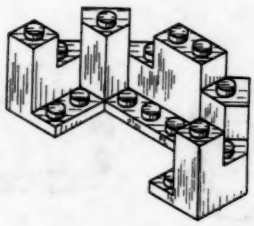


332,643
ELEMENT FOR A TOY BUILDING SET
Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,109
Term of patent 14 years
U.S. Cl. D21—108

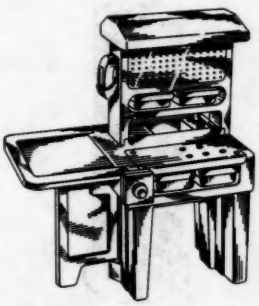
332,644
ELEMENT FOR A TOY BUILDING SET
Helle Rahbek, Vildbjerg, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,120
Term of patent 14 years
U.S. Cl. D21—108



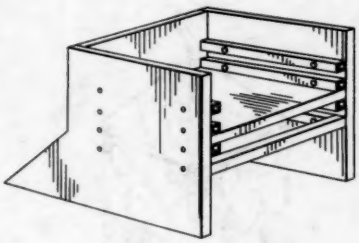
332,645
ELEMENT FOR A TOY BUILDING SET
Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,124
Term of patent 14 years
U.S. Cl. D21—108



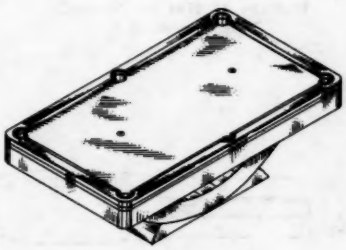
332,646
WORKSHOP TOY
Kevin R. Aker, Hudson, and Robert L. Houry, Solon, both of Ohio, assignors to The Little Tikes Company, Hudson, Ohio
Filed Nov. 8, 1990, Ser. No. 611,350
Term of patent 14 years
U.S. Cl. D21—121



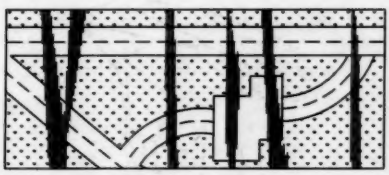
332,647
ADJUSTABLE STEP-UP BOX FOR EXERCISE
John Johnson, 709 S. Woodland, Pittsburg, Kans. 66762
Filed Mar. 15, 1991, Ser. No. 670,161
Term of patent 14 years
U.S. Cl. D21—191



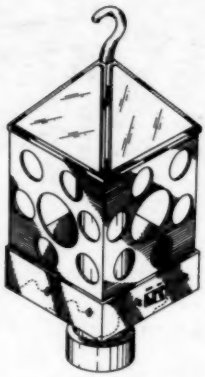
332,648
POOL TABLE
Joseph E. Mitchell, Jr., 601 Tallahassee Dr., NE., St. Petersburg, Fla. 33702
Filed Apr. 10, 1991, Ser. No. 683,004
Term of patent 14 years
U.S. Cl. D21—232



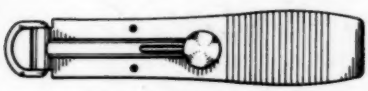
332,649
FLEA TRAP
Mary Bremner, 7804 Bell Garden Ave., Bell Gardens, Calif. 90201-5407
Filed May 4, 1990, Ser. No. 518,863
Term of patent 14 years
U.S. Cl. D22—122



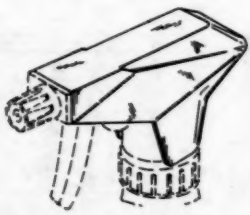
332,650
SOLAR POWERED INSECT KILLER
Paul Pavelko, Jr., 1015 Wood St., Bethlehem, Pa. 18018
Filed Oct. 23, 1990, Ser. No. 601,563
Term of patent 14 years
U.S. Cl. D22—122



332,651
COMBINED LINE CUTTER AND RETRACTABLE NEEDLE
Stanton H. Sugerman, Coventry, R.I., assignor to S. Sugerman & Associates, Inc., Providence, R.I.
Filed Oct. 16, 1990, Ser. No. 598,323
Term of patent 14 years
U.S. Cl. D22—149

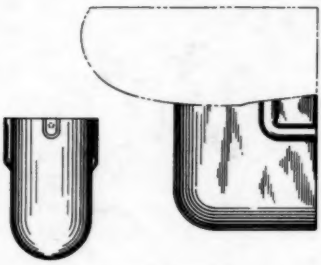


332,652
TRIGGER SPRAYER
Donald D. Foster, and Martin S. Laffey, both of St. Charles, Mo., assignors to Contico International, Inc., St. Louis, Mo.
Filed Feb. 11, 1991, Ser. No. 653,107
Term of patent 14 years
U.S. Cl. D23—226



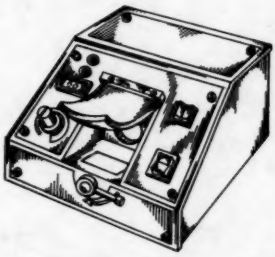
332,653
WELDING OUTLET
Bobby W. Ryan, Houston, Tex., assignor to WFI International, Inc., Houston, Tex.
Filed Jun. 12, 1990, Ser. No. 536,487
Term of patent 14 years
U.S. Cl. D23—262

332,654
SHROUD FOR A LAVATORY
Mary J. Reid, Sheboygan, Wis., and Lorin R. Wigman, Long Beach, Calif., assignors to Kohler Co., Kohler, Wis.
Filed Jun. 12, 1990, Ser. No. 537,535
Term of patent 14 years
U.S. Cl. D23—308

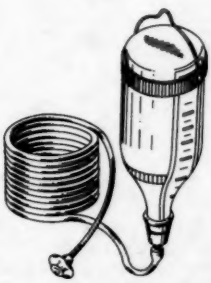


332,655
PORTABLE ELECTRIC FAN
James R. Lytle, New Haven; James J. Cich, Jr., and Joseph C. Carley, both of Fort Wayne, all of Ind., assignors to Patton Electric Company, Inc., New Haven, Ind.
Filed Oct. 4, 1991, Ser. No. 771,243
Term of patent 14 years
U.S. Cl. D23—378

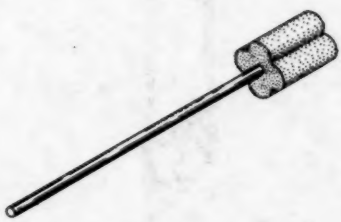
332,656
CONTROL UNIT FOR MEDICAL AND SURGICAL FLUID DELIVERY DEVICE OR THE LIKE
Robert W. Atkinson, Dover; Michael J. Laco, Sherrodsville, and William J. Donizetti, Dover, all of Ohio, assignors to Zimmer, Inc., Warsaw, Ind.
Filed Apr. 25, 1990, Ser. No. 514,073
Term of patent 14 years
U.S. Cl. D24—111



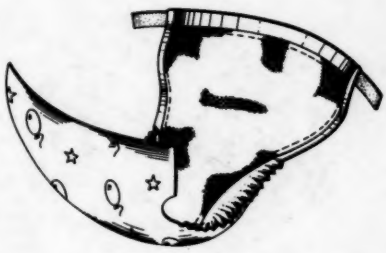
332,657
ORAL REGULATED FEEDER
Russell Bamford, 78 Oglivie St., Box 669, Faro Yukon, Canada Y0B-1K0
Filed May 1, 1990, Ser. No. 517,058
Term of patent 14 years
U.S. Cl. D24—117



332,658
ORAL SWAB
Charles P. Thompson, North Canton, Ohio, assignor to Plastic Engineered Products Company, Canal Fulton, Ohio
Filed Jul. 19, 1988, Ser. No. 221,443
Term of patent 14 years
U.S. Cl. D24—117

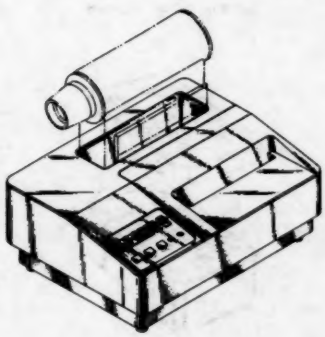


332,659
WETNESS INDICATING DIAPER
Philip Bisaga, 121 Hartford Ave. East, Mendon, Mass. 01756
Filed Sep. 10, 1990, Ser. No. 580,309
Term of patent 14 years
U.S. Cl. D24—126

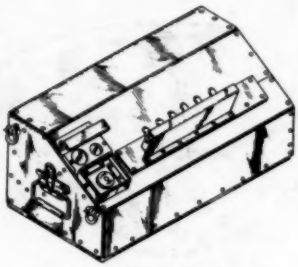


332,660
SURGICAL CLIP APPLIER
Paul O. Rawson, Easton, and Mace H. Bell, III, Rowayton, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Sep. 17, 1990, Ser. No. 583,722
Term of patent 14 years
U.S. Cl. D24—145

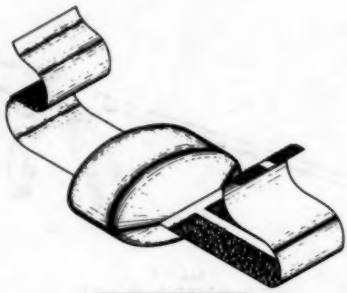
332,661
SPIROMETER BASE UNIT
Paul B. Sweeney, Jr., Syracuse, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.
Filed Mar. 30, 1990, Ser. No. 501,502
Term of patent 14 years
U.S. Cl. D24—169



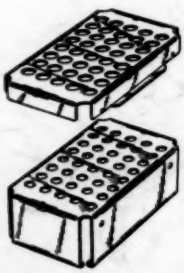
332,662
PORTABLE OXYGEN SYSTEM
Tomio Miya, Culver City, Calif., assignor to American Safety Flight Systems, Inc., Glendale, Calif.
Filed Aug. 20, 1990, Ser. No. 570,290
Term of patent 14 years
U.S. Cl. D24—164



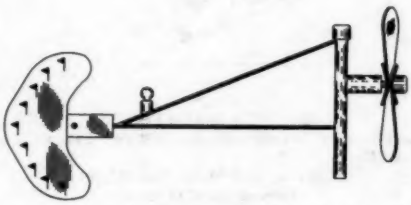
332,663
COMBINED ORTHOPEDIC PILLOW AND STRAPPING
Timothy P. Liszewski, 115 Henrietta Blvd., Amsterdam, N.Y. 12010
Filed Mar. 12, 1990, Ser. No. 491,841
Term of patent 14 years
U.S. Cl. D24—190



332,664
COMBINED NEEDLE RECAPPING TRAY AND LID
Brian F. Sincock, Dernancourt, Australia, assignor to Ausmedics Pty. Ltd., Port Lincoln, Australia
Filed Mar. 23, 1990, Ser. No. 497,638
Term of patent 14 years
U.S. Cl. D24—227

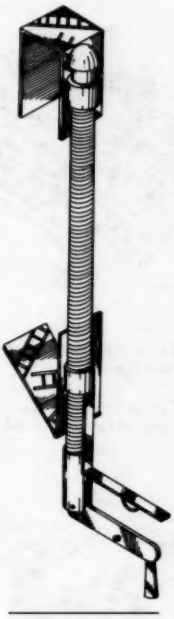


332,665
WINDMILL
Richard E. Garrison, 1961 Canal Rd. South, Eaton Rapids, Mich. 48827
Filed Dec. 14, 1990, Ser. No. 627,370
Term of patent 14 years
U.S. Cl. D25—1

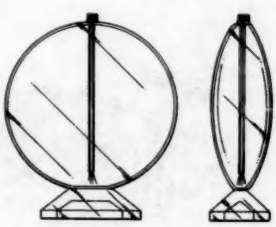


332,666
DOOR PANEL
Steven R. Wilkening, Grand Rapids, Mich., assignor to ODL, Incorporated, Zeeland, Mich.
Filed Oct. 29, 1990, Ser. No. 605,187
Term of patent 14 years
U.S. Cl. D25—48

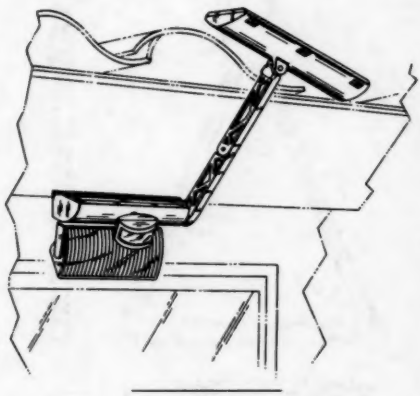
332,667
LADDER SUPPORT
Barry L. Brooks, 6546 Highway 54, Sharpsburg, Ga. 30277
Filed Mar. 19, 1990, Ser. No. 495,212
Term of patent 14 years
U.S. Cl. D25—68



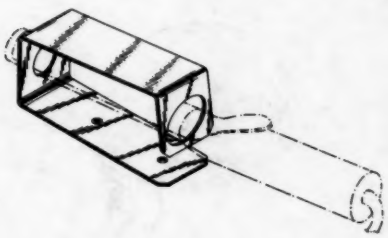
332,668
OIL CANDLE
Karen Boss, 34 Shady La., Ross, Calif. 94957-1746
Filed Apr. 5, 1991, Ser. No. 681,200
Term of patent 14 years
U.S. Cl. D26—11



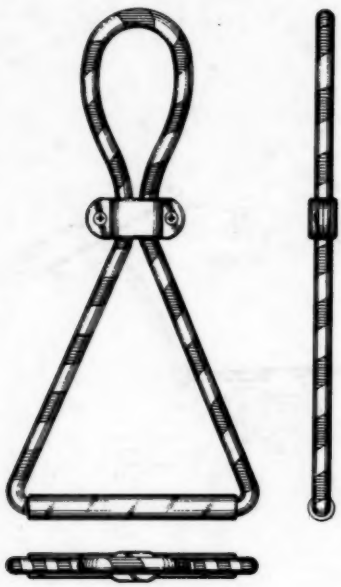
332,669
SOLAR POWERED LIGHT WITH MOTION SENSOR
John S. Frost; David P. Tanner, both of Thousand Oaks, Calif., and Ronald L. Sitzema, Jr., Ellsworth, Mich., assignors to Siemens Solar Industries, L. P., Camarillo, Calif.
Filed Jan. 4, 1991, Ser. No. 637,883
Term of patent 14 years
U.S. Cl. D26—63



332,670
HAIR CURLING IRON SUPPORT STAND
James G. McFarland, 1076 Maria Dr., Milford, Ohio 45150
Filed Oct. 9, 1990, Ser. No. 593,950
Term of patent 14 years
U.S. Cl. D28—38

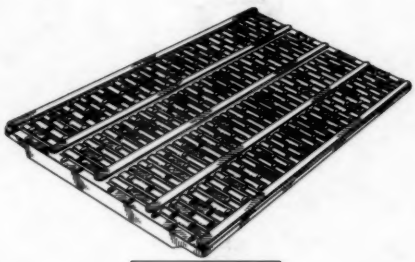


332,671
CHILD WALKING TRAINING DEVICE
Keith A. Borg, 2223 Sebring Ave., Simi Valley, Calif. 93065
Filed Oct. 31, 1990, Ser. No. 608,325
Term of patent 14 years
U.S. Cl. D29—10

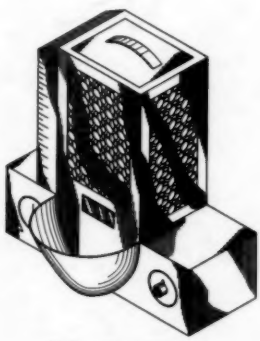


332,672
DISPOSABLE HELMET LINER
Jean T. Abate, 14 Southpond Cir., Chesire, Conn. 06410
Filed Aug. 8, 1990, Ser. No. 564,298
Term of patent 14 years
U.S. Cl. D29—15

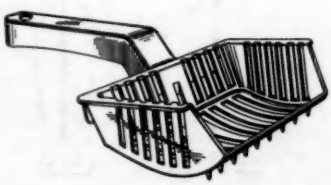
332,673
SLOTTED NON-SKID FLOOR FOR ANIMALS
Henry Kovatch, Caracas, Venezuela, assignor to Industrias Uniplasticas C.A., Guatire, Venezuela
Filed May 24, 1990, Ser. No. 527,541
Term of patent 14 years
U.S. Cl. D30—120



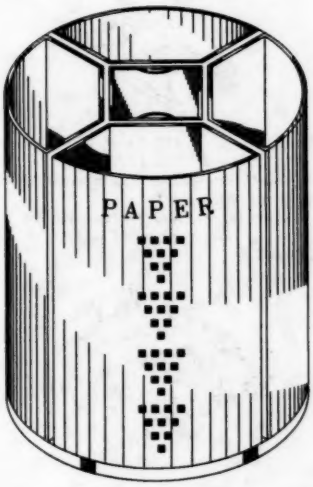
332,674
AUTOMATIC PET FEEDER
Judith K. Zinsky, 10435 Lindley Ave. #150, Northridge, Calif. 91326
Filed Feb. 7, 1991, Ser. No. 651,910
Term of patent 14 years
U.S. Cl. D30—122



332,675
SCOOP FOR CAT LITTER
Allen Simon, East Northport, N.Y., assignor to Four Paws Products Ltd., Hauppauge, N.Y.
Filed Oct. 3, 1990, Ser. No. 592,080
Term of patent 14 years
U.S. Cl. D30—162

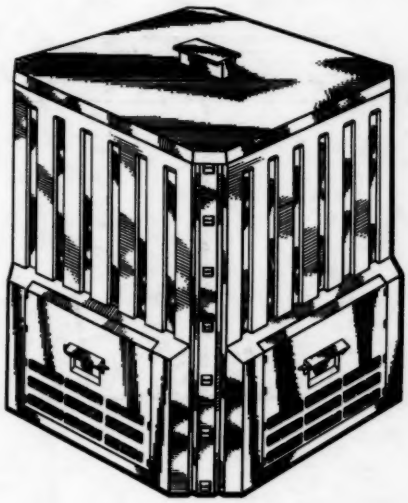


332,676
MULTIPLE COMPARTMENT TRASH RECEPTACLE
Stephen P. Benson, 18036 Crownhill Dr., South Bend, Ind. 46637
Filed Mar. 14, 1991, Ser. No. 669,333
Term of patent 14 years
U.S. Cl. D34—1



332,677
FABRIC COVERED WASTEBASKETS
Samuel Samelson, Goldsboro, N.C., assignor to Ex-Cell Home Fashion, Inc., New York, N.Y.
Filed Aug. 28, 1991, Ser. No. 706,079
Term of patent 14 years
U.S. Cl. D34—1

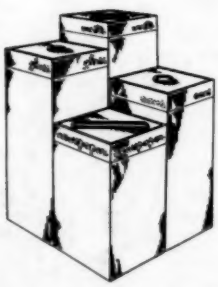
332,678
COMPOST CONTAINER
John L. Barclay, Toronto, and John Elksnitis, Concord, both of Canada, assignors to Barclay Recycling Inc., Toronto, Canada
Filed Sep. 4, 1991, Ser. No. 754,682
Claims priority, application Canada, May 23, 1991, 2305916
Term of patent 14 years
U.S. Cl. D34—1



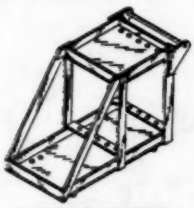
332,679
WASTE RECEPTACLE
David M. Hines, Santa Ana, Calif., assignor to Bobrick Washroom Equipment, Inc., North Hollywood, Calif.
Filed Nov. 15, 1991, Ser. No. 792,773
Term of patent 14 years
U.S. Cl. D34—6

332,680
SHARPS CONTAINER
Bruno J. Ramirez, Simi Valley, Calif., assignor to Devon Industries, Inc., Chatsworth, Calif.
Filed Jan. 24, 1991, Ser. No. 645,299
Term of patent 14 years
U.S. Cl. D34—7

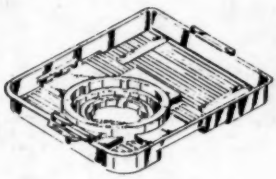
332,681
MODULAR SYSTEM OF RECYCLABLE WASTE RECEPTACLES
Rebecca L. Waterson, Plymouth, and John E. Turek, Hastings, both of Minn., assignors to Liberty Diversified Industries, New Hope, Minn.
Filed Apr. 11, 1991, Ser. No. 683,675
Term of patent 14 years
U.S. Cl. D34—7



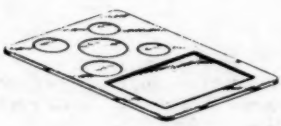
332,682
LAWN AND GARDEN UTILITY CART
Donald A. Staab, 92-45 245th St., Bellerose Terrace, N.Y. 11001
Filed Apr. 11, 1991, Ser. No. 683,680
Term of patent 14 years
U.S. Cl. D34—21



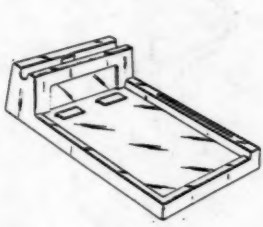
332,683
PAINT TRAY
Raymond C. Adolf, Doylestown, Pa., assignor to Nation/Ruskin, Inc., Montgomeryville, Pa.
Filed Jul. 24, 1990, Ser. No. 558,556
Term of patent 14 years
U.S. Cl. D34—45



332,684
COIN-DISPLAY FRAME
Cherri K. Melamed, Long Beach, Calif., assignor to R.G.M. Xpress, Ltd., Costa Mesa, Calif.
Filed Oct. 2, 1990, Ser. No. 591,867
Term of patent 14 years
U.S. Cl. D99—34



332,685
LIGHTED GRATUITIES/TIP TRAY
Richard E. Edwards, 1750 Ocean Ave., Long Beach, Calif. 90808
Filed Jan. 14, 1991, Ser. No. 641,442
Term of patent 14 years
U.S. Cl. D99—36



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF JANUARY, 1993

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Aardelite Holding B.V.: *See*—
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Abatjoglou, Anthony G.; Bryant, David R.; and Peterson, Ronald R., to Union Carbide Chemicals & Plastics Technology Corporation. Process for catalyst aldehyde product separation. 5,180,854, Cl. 568-454.000.

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Abbagnaro, Louis A.: *See*—
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Abbott Laboratories: *See*—
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Natwick, Vernon R.; Lawless, Michael W.; Doll, Joseph E.; and Wu, Chung-You C., 5,180,287, Cl. 417-43.000.

Abboud, Harry I.; and Efferson, Chip. Closed loop incineration process. 5,179,903, Cl. 110-345.000.

Abdi, Behrooz; and Stuhlmiller, Gary, to Motorola, Inc. Digital timing discriminator. 5,180,935, Cl. 307-524.000.

Abdul, Abdul S., to General Motors Corporation. Method for in situ removal of a spilled fluid from soil. 5,180,013, Cl. 166-370.000.

Abe, Hidetoshi: *See*—
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Abe, Hiroomi; Fujii, Takeshi; and Mitsui, Kiyoshi, to Sumitomo Chemical Company, Limited. Thermoplastic polyamide resin composition containing a fluidity modifier. 5,180,763, Cl. 524-112.000.

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Abe, Kazunobu: *See*—
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Abe, Shizuo; Tokoro, Masayoshi; and Kawauchi, Masato, to Toyota Jidosha Kabushiki Kaisha. Cooling system of a cylinder of an internal combustion engine. 5,179,915, Cl. 123-41.790.

Abe, Yasuhiko, to Kyoto Handotai Co., Ltd. Method for slicing a semiconductor silicon single crystal. 5,180,469, Cl. 156-653.000.

Abendschein, Frederic H.: *See*—
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Abiomed, Inc.: *See*—
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Abousabha, Naji G.; and Tran, Khanh C., to General Motors Corporation. Radial compressor with discharge chamber dams. 5,180,292, Cl. 417-273.000.

Abra, Robert; and Szoka, Francis C., to Liposome Technology, Inc. Stabilized liposome/amphotercin B composition and method. 5,180,713, Cl. 514-31.000.

Abramovitz, Irwin J.: *See*—
Miler, Robert L.; and Abramovitz, Irwin J., 5,181,036, Cl. 342-15.000.

Abys, Joseph A.; Kadija, Igor V.; Maisano, Joseph J., Jr.; and Nakahara, Shohei, to AT&T Bell Laboratories. Thermal annealing of palladium alloys. 5,180,482, Cl. 205-224.000.

Ackerman, David A.; Blonder, Greg E.; and MacDonald, William M., to AT&T Bell Laboratories. Photonics module apparatus. 5,181,216, Cl. 372-36.000.

Actel Corporation: *See*—
Forouhi, Abdul R., 5,181,096, Cl. 257-530.000.

Adachi, Etsushi; Adachi, Hiroshi; Mochizuki, Hiroshi; and Kanegae, Hirozoh, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing a semiconductor device sealed with molding resin employing a stress buffering film of silicone. 5,180,691, Cl. 437-235.000.

Adachi, Hideyuki: *See*—
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Agabekov, Branka. Electric supply ramp with support profile. 5,180,887, Cl. 174-72.00B.

Agarwal, Dwarika P., to Leach & Garner Co. Gold alloys of exceptional yellow color and reversible hardness. 5,180,551, Cl. 420-511.000.

Agency of Industrial Science and Technology: *See*—
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Aghajanian, Michael K.: *See*—
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Aiga, Masayuki; and Shibata, Yoshitaka, to Sanyo Electric Co., Ltd. Magnetron having coaxial choke means extending into the output side insulating tube space. 5,180,946, Cl. 315-39.510.

Air Products and Chemicals Inc.: *See*—
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Alagna, Samuel M. Horseshoe having replaceable horseshoe pad. 5,180,017, Cl. 168-12.000.

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Arai, Hitoshi; Kono, Motomichi; Kasai, Masaji; Gomi, Katsushige; and Ashizawa, adashi, to Kyowa Hakko Kogyo Co., Ltd. Mitomycin derivatives. 5,180,825, Cl. 544-318.000.
Arai, Masatoshi; Inoue, Yoshifumi; and Inoue, Yoshio, to Shin-Etsu Chemical Co., Ltd. Room temperature curable organopolysiloxane composition. 5,180,771, Cl. 524-588.000.
Arai, Takeo: *See—*
Akune, Kenichi; Watanabe, Naotaka; Inomiya, Yukihiro; Itoda, Hiroshi; Arai, Takeo; and Funato, Reiko, 5,180,473, Cl. 162-168.200.
Araki, Hiromitsu: *See—*
Kiyohara, Kazuto; Araki, Hiromitsu; Yamazaki, Toshiaki; and Harada, Ichiya, 5,180,658, Cl. 430-533.000.
Araki, Kazuhiro, to Minolta Camera Kabushiki Kaisha. Copying apparatus. 5,181,073, Cl. 355-243.000.
Araki, Osamu, to Inax Corporation. Hot/cold water mixing faucet and mounting structure therefor. 5,180,140, Cl. 251-291.000.
Aramaki, Hitoshi: *See—*
Matsuura, Hitoshi; and Aramaki, Hitoshi, 5,180,957, Cl. 318-578.000.
Argus International: *See—*
Costello, Bernard J., 5,180,611, Cl. 427-96.000.
Arima, Yukio; Yanagimoto, Hiroaki; Kunitomo, Yuichi; and Tominaga, Tetsuyoshi, to Hitachi Construction Machinery Company, Ltd. Ultrasonic inspection and imaging instrument. 5,179,954, Cl. 128-660.070.
Arjomari Europe: *See—*
Escabasse, Jean-Yves, 5,180,614, Cl. 428-34.200.
Arnason, John T.: *See—*
Morand, Peter; Arnason, John T.; Philogene, Bernard J. R.; MacEachern, Anita M.; Leitch, Leonard C.; and Kaminski, Jerzy, 5,180,838, Cl. 549-59.000.
Arnold, James H.; Perisho, Randal J.; DeWitt, Michael D.; and Soucie, Wayne L., to Orscheln Co. Electronically controlled parking brake system. 5,180,038, Cl. 188-171.000.
Artigalas, Max, to Thomson Consumer Electronics. Television camera and display employing quincuncial scanning. 5,181,102, Cl. 358-56.000.
Arzco Medical Electronics Inc.: *See—*
Buinevicius, Rimas P.; and Metzger, William, 5,179,952, Cl. 128-642.000.
Asada, Junichi: *See—*
Nishiwaki, Seiji; Uchida, Shinji; and Asada, Junichi, 5,181,265, Cl. 385-33.000.
Asahi Denka Kogyo Kabushiki Kaisha: *See—*
Moriya, Iwao; Sugie, Masayuki; Iwasaki, Masayoshi; and Sakata, Junichiro, 5,180,603, Cl. 426-556.000.
Asahi Glass Company Ltd.: *See—*
Sugaya, Yoshio; Terada, Ichiro; Sanekata, Kiyonari; and Horie, Hirofumi, 5,180,750, Cl. 521-32.000.
Tarumi, Yoshihiko; Takekoshi, Atuhisa; Inaba, Mamoru; Nishi, Yoshiro; Sakurai, Masaaki; Sakamoto, Satoshi; and Sato, Kimihiko, 5,180,228, Cl. 374-139.000.
Tsuchimoto, Yoshihiro; Ikezawa, Toshikazu; Morihiro, Naoki; and Shimizu, Naoya, 5,180,412, Cl. 65-66.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Itoh, Homare; Shin, Takashi; Yajima, Takahisa; and Fukuyasu, Shigeki, 5,180,672, Cl. 435-190.000.
Asahi Kogaku Kogyo K.K.: *See—*
Sumita, Masaya, 5,180,426, Cl. 106-35.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Asai, Kazuo; and Kikuchi, Masaharu, 5,181,142, Cl. 359-581.000.
Kawasaki, Masahiro; Takahashi, Hiroyuki; and Iwamoto, Shigeru, 5,181,061, Cl. 354-400.000.
Kobayshi, Takeo; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, 5,181,060, Cl. 354-238.100.
Nishikawa, Tomoyuki, 5,181,076, Cl. 355-315.000.
Asahi Machinery Ltd.: *See—*
Takeuchi, Takayuki; and Hirata, Isao, 5,179,882, Cl. 83-125.000.
Asai, Kazuo; and Kikuchi, Masaharu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Plastic lens and method of forming an anti-reflecting layer on a plastic lens. 5,181,142, Cl. 359-581.000.
Asai, Toshimasa, to Juki Corporation. Apparatus for separating and gripping stacked sheets. 5,180,155, Cl. 271-21.000.
Asaka, Tatsuya: *See—*
Mori, Katsumi; Asaka, Tatsuya; and Iwano, Hideaki, 5,181,219, Cl. 372-45.000.
Mori, Katsumi; Asaka, Tatsuya; and Iwano, Hideaki, 5,181,221, Cl. 372-46.000.
Asami, Sumio: *See—*
Shinmen, Yoshifumi; Akimoto, Kengo; Asami, Sumio; Suwa, Yoshihide; Kitagawa, Yoshinori; Sugano, Michihiro; Yamada, Hideaki; and Shimizu, Sakayu, 5,180,588, Cl. 424-439.000.
Asano, Nobuhiro; and Kobayashi, Hiroshi, to Nissan Motor Co., Ltd. Diaphragm type pressure sensor. 5,179,861, Cl. 73-726.000.
Asbury, Jimmie; and Davis, John W., to IVHS Technologies, Inc. Target persistence filter for multi-frequency automotive radar system. 5,181,038, Cl. 342-70.000.
Ascom Tech. AG.: *See—*
Neeser, Fredy D.; Hufschmid, Markus D.; and Ruprecht, Jurg P., 5,181,225, Cl. 375-1.000.
Asea Brown Boveri Ltd.: *See—*
Nazmy, Mohamed Y., 5,180,451, Cl. 148-675.000.
Ashizawa, adashi: *See—*
Arai, Hitoshi; Kono, Motomichi; Kasai, Masaji; Gomi, Katsushige; and Ashizawa, adashi, 5,180,825, Cl. 544-318.000.
AST Research, Inc.: *See—*
Kim, Jason S., 5,181,029, Cl. 241-20.000.
Astra-Vent AB: *See—*
Loreth, Andrzej; and Torok, Vilmos, 5,180,404, Cl. 55-117.000.
Asulab S.A.: *See—*
Paratte, Lionel; Bornand, Etienne; and Racine, Georges-Andre , 5,180,940, Cl. 310-40.0MM.
AT&T Bell Laboratories: *See—*
Abys, Joseph A.; Kadija, Igor V.; Maisano, Joseph J., Jr.; and Nakahara, Shohei, 5,180,482, Cl. 205-224.000.
Ackerman, David A.; Blonder, Greg E.; and MacDonald, William M., 5,181,216, Cl. 372-36.000.
Chung, Yun C.; DiGiovanni, David J.; Stone, Julian; Sulhoff, James W.; and Zyskind, John L., 5,181,210, Cl. 372-6.000.
Dowden, Douglas C.; Hemmeter, Richard W.; Herr, Diane E.; McCormick, William K.; Petrelli, Robert; Piereth, Richard J.; Salchenberger, Samuel M.; Sehgal, Chander S.; and Verma, Mahendra K., 5,181,237, Cl. 379-88.000.
Fang, San-Chin; Melville, Robert C.; and Trajkovic, Ljiljana, 5,181,179, Cl. 364-488.000.
Fatehi, Mohammad T.; and Srinivasan, Nattu V., 5,181,134, Cl. 359-117.000.
Medamana, John B.; Palmer, John W.; and Weber, Roy P., 5,181,238, Cl. 379-95.000.
Petisce, James R., 5,181,269, Cl. 385-128.000.
Stack, Larry D., 5,181,242, Cl. 379-445.000.
Atlantic Metals Corporation: *See—*
Koul, Maharaj K.; Whitaker, Franklin T.; and Paul, Richard W., 5,179,997, Cl. 164-473.000.
Atlantic Richfield Company: *See—*
McCormack, Michael D.; and Rock, Alan D., 5,181,171, Cl. 364-421.000.
Atochem: *See—*
Seguela, Brigitte; and Kaifasz, Patrick, 5,180,783, Cl. 525-198.000.
Atomic Energy of Canada Limited: *See—*
Metcalfe, Raymond, 5,180,172, Cl. 277-27.000.
Atsugi Unisia Corporation: *See—*
Yamaoka, Fumiyuki; Sasaki, Mitsuo; Nakazawa, Chiharu; and Sugiyama, Hiroyuki, 5,180,129, Cl. 248-230.000.
Atsumi, Shigeru, to Kabushiki Kaisha Toshiba. Input protection resistor used in input protection circuit. 5,181,092, Cl. 257-361.000.
Atsumi, Yoshinori: *See—*
Sugiyama, Kazuhiro; and Atsumi, Yoshinori, 5,180,888, Cl. 174-94.00R.
Atwood, Robert K. Mass air flow meter. 5,179,858, Cl. 73-118.200.
Augat Communications Group Inc.: *See—*
Hopper, Scott R., 5,181,272, Cl. 385-139.000.
Ausimont S.r.l.: *See—*
Venturello, Carlo; and Cavallotti, Claudio, 5,180,516, Cl. 252-186.100.
Aust, Gilbert M.; and Taylor, Timothy E. Anterior lumbar/cervical bicortical compression plate. 5,180,381, Cl. 606-61.000.

Austermann, Ralf, to U.S. Philips Corporation. Circuit arrangement for commutating a reluctance motor. 5,180,960, Cl. 318-701.000.

Austin, Richard G.; and Patton, Tad L., to Exxon Chemical Patents Inc. Process for converting polyketones to polyesters with organic peroxy acid. 5,180,797, Cl. 525-539.000.

Auto-Shade, Inc.: *See*—
Book, Steven C., 5,179,741, Cl. 5-417.000.

Autogenesis Corporation: *See*—
Pursley, John A.; Holloway, Jordan M.; and Wakefield, Thomas L., 5,180,380, Cl. 606-54.000.

Avery Dennison Corporation: *See*—
Plamthottam, Sebastian S.; and Ozari, Yehuda, 5,180,635, Cl. 428-345.000.

Avery, Mitchell A.; and Chong, Wesley K. M., to SRI International. Process for preparing analogs of artemisinin. 5,180,840, Cl. 549-348.000.

Avitan, Isaac, to Raymond Corporation. Variable ratio steering system for a motor vehicle. 5,181,173, Cl. 364-424.050.

Axis USA, Incorporated: *See*—
Habsburg-Lothringen, Sandor, 5,179,910, Cl. 118-634.000.

Axthammer, Ludwig; and Wosner, Felix, to Fichtel & Sachs AG. Fluid passage unit. 5,180,039, Cl. 188-299.000.

B&W Fuel Company: *See*—
Smentek, Thomas J., 5,180,540, Cl. 376-261.000.

Babbitt, Richard W.: *See*—
Stern, Richard A.; and Babbitt, Richard W., 5,180,997, Cl. 333-24.200.

Babchuk, Victor E.; and Brown, Gordon R. Portable cattle gate. 5,179,801, Cl. 49-58.000.

Babin, Didier; Demoute, Jean-Pierre; and Tessier, Jean, to Roussel Uclaf. Pyrethrinoid esters carrying an indanyl nucleus and their use as pesticides. 5,180,741, Cl. 514-531.000.

Bacchi, Cyrus J.: *See*—
Sufrin, Janice R.; Bacchi, Cyrus J.; Porter, Carl W.; Nathan, Henry; Spiess, Arthur J.; and Yarlett, Nigel, 5,180,714, Cl. 514-46.000.

Backer, Marcella R.; Cavender, Ralston R., Jr.; Jones, Peter C.; and Murphy, James A., to Corning Incorporated. Optical waveguide fiber with titania-silica outer cladding and method of manufacturing. 5,180,411, Cl. 65-3.120.

Badger Meter, Inc.: *See*—
Strobel, Donald H.; Pridemore, Donald F.; and Gomez, Greg M, 5,181,241, Cl. 379-107.000.

Baer, Thomas M.; and Head, David F., to Spectra-Physics, Incorporated. High-efficiency mode-matched transversely-pumped solid state laser amplifier. 5,181,223, Cl. 372-69.000.

Bagrodia, Shriram; Fagerburg, David R.; Gedon, Steven; Watkins, Joseph J.; Lawrence, Paul B.; and Rule, Mark, to Eastman Kodak Company. Blends of copoly(arylene sulfide) and ethylene-propylene rubber. 5,180,775, Cl. 525-64.000.

Bagshaw, John M.; and Bowles, Donald C., to GEC-Marconi Limited. Display apparatus. 5,181,013, Cl. 340-702.000.

Bailey, Dana A.: *See*—
LaVallee, James R.; Hilsenbeck, Jerry M.; Brown, James G.; Sumner, Roger A.; Zazzera, Andre C.; and Bailey, Dana A., 5,181,236, Cl. 379-67.000.

Bailey, Jerome M.; and Shively, John E., to City of Hope. C-terminal peptide or protein sequencing reagent and method. 5,180,807, Cl. 530-345.000.

Bainbridge, Ross S.; and Steels, Gordon, to APV Baker Inc. Method and apparatus for controlled molding of chocolate shell goods and the like. 5,180,602, Cl. 426-515.000.

Bair, Keith A.: *See*—
Chen, Fu; Boyette, Scott M.; and Bair, Keith A., 5,180,498, Cl. 210-697.000.

Bak, Chan S.; Miller, Leroy J.; and Van Ast, Camille I., to Hughes Aircraft Company. Method of fabricating anisometric metal needles and birefringent suspension thereof in dielectric fluid. 5,179,993, Cl. 164-46.000.

Bakanowsky, Louis J., III, to Curtis Manufacturing Company, Inc. Video game or computer cleaning cartridge. 5,179,808, Cl. 51-205.0WG.

Baker, Eddie G.; and Elliott, Douglas C., to Battelle Memorial Institute. Method of upgrading oils containing hydroxyaromatic hydrocarbon compounds to highly aromatic gasoline. 5,180,868, Cl. 585-240.000.

Baker Hughes Incorporated: *See*—
Wenholz, Bruce; Gault, R. H.; and Jones, Kerry A., 5,180,289, Cl. 417-53.000.

Bakx, Martinus C. M., to Mead Corporation, The. Wrap-around carton with end closure panels. 5,180,054, Cl. 206-140.000.

Baldwin Filters, Inc.: *See*—
Eihusen, John A.; and Jared, Roy A., 5,180,490, Cl. 210-239.000.

Balestrieri, Harry. Putting practice device. 5,180,168, Cl. 273-187.00R.

Ballard, Denis G. H.; Haddleton, David M.; and Twose, David L., to Imperial Chemical Industries PLC. Process for polymerizing methacrylic acid ester monomers. 5,180,799, Cl. 526-177.000.

Ballinger, Jon C. Semi-automatic coupling apparatus. 5,179,794, Cl. 37-117.500.

Balzers Aktiengesellschaft: *See*—
Wagner, Rudolf; and Hirscher, Hans, 5,180,000, Cl. 165-80.100.

Bane, Mark: *See*—
Schick, David; and Bane, Mark, 5,180,902, Cl. 235-380.000.

Banerjee, Arindam; and Guha, Subhendu, to Energy Conversion Devices, Inc. Method for continuously depositing a transparent oxide material by chemical pyrolysis. 5,180,686, Cl. 437-181.000.

Banks, Eddie D.; Hamatani, Tomio; and Wong, Chung-Wah F., to Boeing Company, The. Aircraft door hinge mechanism with selectively triggerable actuator. 5,180,121, Cl. 244-129.500.

Bansard, Joel, to Thomson-Brandt Armements. System of firing control with programmable delays for projectile having at least one warhead. 5,180,882, Cl. 102-216.000.

Bar-Shalom, Daniel: *See*—
Skeie, Einar; and Bar-Shalom, Daniel, 5,180,392, Cl. 623-11.000.

Baran, John S.: *See*—
Hanson, Gunnar J.; Baran, John S.; Weissing, Dave; and Russell, Mark, 5,180,725, Cl. 514-249.000.
Hanson, Gunnar J.; Baran, John S.; Weissing, Dave; and Russell, Mark, 5,180,744, Cl. 514-616.000.

Barbaste, Regis: *See*—
Zoccarato, Walter; Bernard, Theron; and Barbaste, Regis, 5,180,985, Cl. 324-613.000.

Barcza, William K.; and Kessell, Steven M., to United Technologies Corporation. Augmenter flame holder construction. 5,179,832, Cl. 60-261.000.

Barde, Yves-Alain; Leibrock, Joachim; Lottspeich, Friedrich; Yancopoulos, George; and Thoenen, Hans. Brain-derived neurotrophic factor. 5,180,820, Cl. 536-23.510.

Barkan, Edward D.: *See*—
Shepard, Howard M.; Barkan, Edward D.; and Swartz, Jerome, 5,180,904, Cl. 235-470.000.

Barlow, Wayne K.: *See*—
Stokes, Barry O.; Bradshaw, Gary D.; and Barlow, Wayne K., 5,180,606, Cl. 427-2.000.

Barnes, John D.; Fishburne, Howard H.; Pham, Xuan M.; and Pitt, Linwood L., Jr., to Philip Morris Incorporated. Method where exposed foil on top of cigarette bundle is flat with no apparent folds. 5,179,817, Cl. 53-148.000.

Barnhardt, Charles T.: *See*—
Greenlee, Fredrick E.; and Barnhardt, Charles T., 5,180,267, Cl. 411-432.000.

Barnhart, James L.: *See*—
Levene, Harold B.; Barnhart, James L.; and Widder, Kenneth J., 5,179,955, Cl. 128-662.020.

Barreiro, Armando, to Swerve Systems, Inc. Method for massaging the spinal area and adjacent back muscles in an improved kneading motion. 5,179,940, Cl. 128-33.000.

Barrett, Dale R.; Nguyen, Dat; and Sansevero, Frank M., to Otis Elevator Company. Balustrade and deck mounting assembly for escalator or moving walkway. 5,180,047, Cl. 198-335.000.

Barron, Michael L.: *See*—
Lenhart, Kenneth J.; Barron, Michael L.; Wakeman, Thomas G.; and Bellia, Donald L., 5,180,282, Cl. 415-209.200.

Barry, Kevin P.: *See*—
Drulias, Dean J.; and Barry, Kevin P., 5,179,942, Cl. 128-101.100.

Barten, Brian L.: *See*—
Halstead, Gary A.; Barten, Brian L.; and Trentacoste, Terence, 5,180,098, Cl. 228-183.000.

Bartholomew, Donald D., to Proprietary Technology, Inc. Apparatus for determining change of fuel flow. 5,179,922, Cl. 123-198.0DB.

BASF Aktiengesellschaft: *See*—
Doerper, Thomas; Moeller, Achim; Hillen, Heinz; Keilhauer, Gerhard; Emling, Franz; and Daum, Lothar, 5,180,811, Cl. 530-351.000.
Epple, Gerhard, 5,180,841, Cl. 522-244.000.
Haardt, Udo; Seiler, Erhard; Tatzel, Hermann; Schwager, Harald; and Domas, Friedrich, 5,180,628, Cl. 428-215.000.
Leyendecker, Joachim; Neubauer, Hans-Juergen; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; and Krieg, Wolfgang, 5,180,727, Cl. 514-255.000.
Niessner, Manfred; Beck, Juergen; Hartmann, Heinrich; Kemna, Andreas H.; and Wickel, Stefan, 5,180,804, Cl. 528-500.000.
Rehmer, Gerd; and Boettcher, Andreas, 5,180,756, Cl. 522-35.000.
Taubitz, Christof; Seiler, Erhard; Boehlke, Klaus; and Lausberg, Dietrich, 5,180,778, Cl. 525-74.000.

BASF Corporation: *See*—
Stone, Edward; and Wasyliw, Basil, 5,180,782, Cl. 525-183.000.
Thurman, Laurance R.; and Harris, James B., 5,180,847, Cl. 560-238.000.

Basha, Fatima Z.; DeBernardis, John F.; and Altenbach, Robert J., to Abbott Laboratories. Biogenic amine uptake inhibitors. 5,180,733, Cl. 514-410.000.

Bassaro, Anthony: *See*—
Prusak, Joseph P.; and Bassaro, Anthony, 5,180,150, Cl. 269-254.00R.

Bastien, Jean-Paul: *See*—
Langlais, Thierry; Bastien, Jean-Paul; and Boisson, Jean-Yves, 5,181,229, Cl. 375-114.000.

Bates, H. Richard, personal representative: *See*—
Littleford, Philip O., deceased; and Bates, H. Richard, personal representative, 5,179,961, Cl. 128-772.000.

Battelle Memorial Institute: *See*—
Baker, Eddie G.; and Elliott, Douglas C., 5,180,868, Cl. 585-240.000.

Baudry, Alain; Junino, Alex; and Richard, Herve , to L'Oreal. Method for dyeing keratinous fibres using an aminoindole in combination with a quinone derivative. 5,180,400, Cl. 8-405.000.

Bauer, Jean-Michel; and Bontems, Maurice, to Le Carbone Lorraine. Process for producing sealing components from all-carbon composite material. 5,180,459, Cl. 156-89.000.

Bauer, John R. Trash compactor. 5,179,895, Cl. 100-193.000.

Bauman, John G.; and Wirsching, Randolph C., to Berlex Biosciences Inc. 6-azido-2-fluoropurine, useful in the synthesis of nucleosides. 5,180,824, Cl. 544-251.000.

Baxter International Inc.: *See*—
Johnson, Kenneth M.; and Monaghan, Samira E., 5,180,504, Cl. 210-767.000.

Bayer Aktiengesellschaft: *See*—
Lutjens, Holger; Westeppe, Uwe; Piejko, Karl-Erwin; and Lindner, Christian, 5,180,781, Cl. 525-148.000.
Schwarz, Hans-Helmut; Braden, Rudolf; Marhold, Albrecht; and Negele, Michael, 5,180,861, Cl. 570-160.000.
Starzewski, Karl-Heinz A. O., 5,180,872, Cl. 585-435.000.

Bayer, Helmut, to Electrovac Fabrikation Elektrotechnischer. Thermal switch. 5,181,005, Cl. 337-354.000.

Bayliss, Brian S.: *See*—
Simpson, Leslie J.; and Bayliss, Brian S., 5,180,120, Cl. 244-118.600.

Bayport Controls, Inc.: *See*—
Hickey, William L.; and Boers, Arie, 5,181,120, Cl. 358-229.000.

Beacon Manufacturing Company: *See*—
Owenby, Daniel B.; and Quesinberry, Gene, 5,180,401, Cl. 8-478.000.

Beard, Lloyd R.; and Goe, Melvin B., Jr., to A. B. Chance Company. Compartment barrier for padmounted switchgear. 5,181,164, Cl. 361-345.000.

Beck, Juergen: *See*—
Niessner, Manfred; Beck, Juergen; Hartmann, Heinrich; Kemna, Andreas H.; and Wickel, Stefan, 5,180,804, Cl. 528-500.000.

Becton, Dickinson and Company: *See*—
Khan, Mohammad A.; and Hoang, Minh Q., 5,180,061, Cl. 206-570.000.

Beeckman, Jean W.: *See*—
Ziebarth, Michael S.; Hager, Michael J.; Beeckman, Jean W.; and Plecha, Stanislaw, 5,180,703, Cl. 502-243.000.

Beg, Mirza A.; and Fox, David A. Overcurrent trip circuit. 5,181,155, Cl. 361-94.000.

Beglau, David: *See*—
Czubatyj, Wolodymyr; Ovshinsky, Stanford R.; Wicker, Guy C.; Beglau, David; Himmler, Ronald; Jablonski, David; and Guha, Subhendu, 5,180,690, Cl. 437-233.000.

Behrens, William L.; and Anderson, Arthur, to Chrysler Corporation. Shift control lever assembly. 5,179,870, Cl. 74-475.000.

Behringwerke Aktiengesellschaft: *See*—
Dopatka, Hans-Detlef, 5,180,664, Cl. 435-7.920.
Schmidtberger, Rudolf, 5,180,679, Cl. 436-518.000.

Belanger, Roger R.; Mack, Richard B.; and Novick, Michael A., to Heidelberg Harris GmbH. Delivery device in the folding apparatus of a rotary printing press. 5,180,160, Cl. 271-315.000.

Bell Communications Research, Inc.: *See*—
Lechleider, Joseph W., 5,181,198, Cl. 370-32.100.

Bell, Frank P.: *See*—
Gammill, Ronald B.; and Bell, Frank P., 5,180,717, Cl. 514-63.000.

Bellas, Michael: *See*—
Kuo, Yeong-Jen; and Bellas, Michael, 5,180,842, Cl. 552-293.000.

Bellia, Donald L.: *See*—
Lenhart, Kenneth J.; Barron, Michael L.; Wakeman, Thomas G.; and Bellia, Donald L., 5,180,282, Cl. 415-209.200.

Belvedere Sports: *See*—
Brower, William S., 5,180,143, Cl. 256-24.000.

Bench, Ronald W.: *See*—
Phillips, Thomas R.; Dewolf, Thomas L.; and Bench, Ronald W., 5,179,841, Cl. 62-81.000.

Benczur-Urmossy, Gabor: *See*—
Berger, Gerhard; Benczur-Urmossy, Gabor; and von Benda, Klaus, 5,180,646, Cl. 429-198.000.

Bender, Burnell L., to Navistar International Transportation Corp. Circuit for automatic shut-down of electronically controlled diesel engine. 5,179,920, Cl. 123-198.0DB.

Bender, Robert W.: *See*—
Cusack, Timothy M.; Sickora, Vincent J.; and Bender, Robert W., 5,180,749, Cl. 514-726.000.

Bengel, David W. Current mode multiplexed sample and hold circuit. 5,180,932, Cl. 307-353.000.

Benitez, Jose A. Retractable binoculars attachable to a visor. 5,181,139, Cl. 359-408.000.

Benjamin, David: *See*—
Bruns, David; and Benjamin, David, 5,180,663, Cl. 435-7.400.

Bennett, Charles O. Leaf caddy. 5,180,126, Cl. 248-99.000.

Benson, Jeffrey P.: *See*—
Meekins, Kris J.; and Benson, Jeffrey P., 5,179,999, Cl. 165-41.000.

Beoni, Franco. Middle ear prosthesis. 5,180,391, Cl. 623-10.000.

Berg, Charles J.; Roe, Donald C.; and Lahrman, Frank H., to Procter & Gamble Company, The. Absorbent members containing interparticle crosslinked aggregates. 5,180,622, Cl. 428-192.000.

Berger, Gerhard; Benczur-Urmossy, Gabor; and von Benda, Klaus, to Deutsche Automobilgesellschaft mbH. Nickel-cadium storage battery with improved electrical properties. 5,180,646, Cl. 429-198.000.

Berger, J. Lee. Percutaneous carpal tunnel plasty method. 5,179,963, Cl. 128-898.000.

Berger, Josef; Mick, Doron; and Kleefeld, Joseph, to Harmonic Lightwaves, Inc. Temperature stable solid-state laser package. 5,181,214, Cl. 372-34.000.

Berkey, George E., to Corning Incorporated. Method of making polarization retaining fiber. 5,180,410, Cl. 65-3.110.

Berlex Biosciences Inc.: *See*—
Bauman, John G.; and Wirsching, Randolph C., 5,180,824, Cl. 544-251.000.

Bernadic, Thomas J., to GTE Valenite Corporation. High feed heavy depth of cut insert for the aluminum wheel turning market. 5,180,258, Cl. 407-114.000.

Bernard, Theron: *See*—
Zoccarato, Walter; Bernard, Theron; and Barbaste, Regis, 5,180,985, Cl. 324-613.000.

Bernhardt, Wolfgang; Holzmann, Roland; Schmidt, Guenther; Kirstein, Lothar; and Wetzel, Gerhard, to Robert Bosch GmbH. Hydraulic dual-circuit brake system. 5,180,215, Cl. 303-113.200.

Berry, Waldo A., Jr.; and Klara, Edward M. Scope adjustment for firearms. 5,180,875, Cl. 42-101.000.

Berschied, John R.: *See*—
Winston, Anthony E.; Miskewitz, Regina M.; Walley, Darlene R.; and Berschied, John R., 5,180,576, Cl. 424-52.000.

Berube, Martin; Bilodeau, Julien; Paul, Marlene; Gaucher, Ronald; Cote, Germain; and Boudreault, Guy, to Berube, Martin; Bilodeau, Julien; Paul, Marlene; and Gaucher, Ronald. Apparatus for discharging a fluid and, more particularly, for spraying a liquid. 5,179,982, Cl. 141-20.000.

Bestek Electronics Corp.: *See*—
Huang, Roger M. C., 5,179,856, Cl. 73-4.00R.

Betz Laboratories, Inc.: *See*—
Chen, Fu; Boyette, Scott M.; and Bair, Keith A., 5,180,498, Cl. 210-697.000.

Beumer, John, III: *See*—
Hornburg, Wynn E.; and Beumer, John, III, 5,180,303, Cl. 433-173.000.

Beuving, Lauren J.; and Prader, Peter E., to Masonite Corporation. Method for improving fiberboard mat moldability. 5,179,986, Cl. 144-362.000.

Beverly, James A.: *See*—
Hicks, Bradford W.; Blust, Brian R.; Beverly, James A.; and Schultz, Gary R., 5,179,981, Cl. 141-4.000.

Biba, Gregory A., to G. LeBlanc Corporation. Band Folder with integral handles. 5,180,191, Cl. 281-45.000.

Bibl, Andreas; and Fellingham, George H., to Rastergraphics, Inc. Method of fabricating an integrated thick film electrostatic writing head incorporating in-line-resistors. 5,181,050, Cl. 346-155.000.

Bielawski, Dennis A.: *See*—
Schauss, Craig A.; Neumann, Donald E.; and Bielawski, Dennis A., 5,181,201, Cl. 370-85.100.

Bieri, Hans, to Hydrostress AG. Apparatus for cutting recessed grooves into concrete and rock material. 5,180,209, Cl. 299-41.000.

Bigger, Scott W.: *See*—
Dalrymple, John C.; and Bigger, Scott W., 5,181,014, Cl. 340-703.000.

Bilas, Ronald J.: *See*—
Cook, Robert G.; Runyan, Daniel J.; Rezac, Willard J.; Edds, Thomas A.; and Bilas, Ronald J., 5,180,051, Cl. 200-400.000.

Bilodeau, Julien: *See*—
Berube, Martin; Bilodeau, Julien; Paul, Marlene; Gaucher, Ronald; Cote, Germain; and Boudreault, Guy, 5,179,982, Cl. 141-20.000.

Binaghi, Marc: *See*—
Sempio, Carlo; Anghileri, Andrea; Binaghi, Marc; Ronchetti, Tullo; and Vailati, Italo, 5,180,634, Cl. 428-336.000.

Binks Manufacturing Company: *See*—
Mellette, Robert R., 5,180,104, Cl. 239-8.000.

Binversie, Gregory J.: *See*—
Calamia, David C.; Binversie, Gregory J.; and Petersen, H. Norman, 5,180,320, Cl. 440-61.000.

Bio Merieux: *See*—
Monget, Daniel, 5,180,555, Cl. 422-102.000.

Biomedical Polymers, Inc.: *See*—
Fay, John E.; and Faulkner, Michael T., 5,180,073, Cl. 215-261.000.

BioPak Technology, Ltd.: *See*—
Sinclair, Richard G., 5,180,765, Cl. 524-306.000.

Birkhan, Horst; Kohle, Hans-Juergen; Weigand, Joachim; and Wehner, Winfried, to REWO Chemische Werke GmbH. Fabric softener rinsing agents. 5,180,508, Cl. 252-8.800.

Birtwistle, David H.; Cartere, Peter; and Rosser, David A., to Chesebrough-Pond's USA Co., division of Conopco, Inc. Topical composition comprising a mixture of particular di-alkyl or alkenyl phosphate esters and mono-alkyl or alkenyl phosphate esters. 5,180,579, Cl. 424-70.000.

Bistrack, Carl. Adaptable pressure writing instrument holder. 5,180,239, Cl. 401-6.000.

Bjorck, Lars: *See*—
Gomi, Hideyuki; Hozumi, Tatsunobu; Hattori, Shizuo; Tagawa, Chiaki; Kishimoto, Fumitaka; and Bjorck, Lars, 5,180,810, Cl. 530-350.000.

Bjork, Paul E.: *See*—
Postma, Stephen J.; Gesin, Milford M.; Demma, Nick A.; Bjork, Paul E.; and Wagener, Thomas J., 5,180,978, Cl. 324-207.160.

BK Ladenburg GmbH: *See*—
Wahl, Friedrich; Maurer-Rothmann, Andrea; and Merkenich, Karl, 5,180,564, Cl. 423-309.000.

Blade, Robert J., to Roussel Uclaf. Phenyl or bicyclo-alkenylfluoro amide pesticides. 5,180,737, Cl. 514-463.000.

Blake, Donald L.: *See*—
Dickson, Lawrence J.; and Blake, Donald L., 5,179,778, Cl. 29-876.000.

Blanc, Pierre-Alain: *See*—
Naef, Ferdinand; Decorzani, Rene ; Naef, Regula; Blanc, Pierre-Alain; and van Beem, Nicole, 5,180,710, Cl. 512-26.000.

Blanchette, Gregory J.; and Jessee, Paul E., to Conner Peripherals, Inc. Spindle motor for reduced size disk drive and method of making same. 5,181,148, Cl. 360-99.080.

Bland, Joseph B. Alternative charging method for engine with pressurized valved cell. 5,179,839, Cl. 60-712.000.

Blandano, Francesco: *See*—
Chiaretti, Guido; and Blandano, Francesco, 5,181,264, Cl. 385-33.000.

Blanton, Cornelia H.: *See*—
Mosher, Dan M.; Latham, Larry; Todd, Bob; Blanton, Cornelia H.; Trogolo, Joe R.; and Cotton, David R., 5,181,095, Cl. 257-370.000.

Blaski, Marvin F.: *See*—
Burns, James R.; and Blaski, Marvin F., 5,180,641, Cl. 429-1.000.

Blin, Philippe; Sosin, Laurent; and Loison, Dominique, to Usinor Sacilor. Process and device for continuous casting on a roll or between two rolls. 5,179,996, Cl. 164-428.000.

Block, James P.; Levasheff, Stanley W.; and Jarosek, Gordon G., to LCOA Laminating Company of America. Machine and method for fabricating a sheet metal structure having a corrugated core. 5,179,770, Cl. 29-17.300.

Block Medical, Inc.: *See*—
Cordner, Edward T., Jr.; Payne, Steven R.; and Istratoff, Glenn J., 5,179,983, Cl. 141-27.000.

Blond, Alejandro; Poll, Gerhard; and Tadic, Vedran, to SKF Industrial Trading & Development Co. Method and apparatus for magnetically measuring the thickness of a high relative permeability lubricant film between two relatively moving surfaces. 5,180,980, Cl. 324-229.000.

Blonder, Greg E.: *See*—
Ackerman, David A.; Blonder, Greg E.; and MacDonald, William M., 5,181,216, Cl. 372-36.000.

Bloom Engineering Company, Inc.: *See*—
Hovis, James E.; and Finke, Harry P., 5,180,300, Cl. 431-115.000.

Bloomberg, Dan S., to Xerox Corporation. Segmentation of handwriting and machine printed text. 5,181,255, Cl. 382-9.000.

Blust, Brian R.: *See*—
Hicks, Bradford W.; Blust, Brian R.; Beverly, James A.; and Schultz, Gary R., 5,179,981, Cl. 141-4.000.

BMC Technology Corporation: *See*—
Monsees, John C.; Crownover, Joseph W.; and Burer, Aubrey M., 5,179,773, Cl. 29-25.420.

Boardman, Franklin; and Saferstein, Lowell, to Johnson & Johnson Medical, Inc. Cellulose oxidation by a perfluorinated hydrocarbon solution of nitrogen dioxide. 5,180,398, Cl. 8-181.000.

Boben, Ronald J. Cam operated rail clamping device. 5,180,036, Cl. 188-1.110.

Bobst SA: *See*—
Yerly, Marcel, 5,179,879, Cl. 83-34.000.

BOC Group plc, The: *See*—
Worsfold, Jonathan P., 5,179,840, Cl. 62-64.000.

Bodenseewerk Perkin-Elmer GmbH: *See*—
Dencks, Carl G.; and Roedel, Gunther, 5,181,077, Cl. 356-307.000.

Boehlke, Klaus: *See*—
Taubitz, Christof; Seiler, Erhard; Boehlke, Klaus; and Lausberg, Dietrich, 5,180,778, Cl. 525-74.000.

Boeing Company, The: *See*—
Banks, Eddie D.; Hamatani, Tomio; and Wong, Chung-Wah F., 5,180,121, Cl. 244-129.500.

Boenitz, Maurice J.; and Denner, Harry T., to Cooper Power Systems, Inc. Method of restraining an amorphous metal core. 5,179,776, Cl. 29-609.000.

Boer, Jan H.: *See*—
Smith, Robert M.; Ting, David M. T.; Boer, Jan H.; and Mendelsohn, Marvin, 5,181,162, Cl. 364-419.000.

Boers, Arie: *See*—
Hickey, William L.; and Boers, Arie, 5,181,120, Cl. 358-229.000.

Boettcher, Andreas: *See*—
Rehmer, Gerd; and Boettcher, Andreas, 5,180,756, Cl. 522-35.000.

Boffito, Claudio; and Bolognesi, Massimo, to SAES Getters SpA. Recovery of tritium and deuterium from their oxides and intermetallic compound useful therein. 5,180,568, Cl. 423-248.000.

Bogatin, Yakov, to SPS Technologies, Inc. Magnetic materials. 5,180,445, Cl. 148-302.000.

Bogner, Martin, to GEZE Sport International GmbH. Releasable ski binding. 5,180,183, Cl. 280-629.000.

Bogotzek, Hans; Mairose, Hans-Peter; and Orth, Erich, to Deutsche Airbus GmbH. System for finishing conductor bundles. 5,179,775, Cl. 29-564.400.

Boissau, Alain J. M.: *See*—
Simon, Georges H.; Pichot, Patrice J.; and Boissau, Alain J. M., 5,180,879, Cl. 89-33.170.

Boisson, Jean-Yves: *See*—
Langlais, Thierry; Bastien, Jean-Paul; and Boisson, Jean-Yves, 5,181,229, Cl. 375-114.000.

Boland, John D.; Fournier, Paul J.; Field, John C.; and Densel, David S., to Aeroquip Corporation. Fluid coupling. 5,179,976, Cl. 137-614.060.

Bolanos, Henry: *See*—
Green, David T.; Bolanos, Henry; and Sienkiewicz, Henry, 5,180,373, Cl. 604-167.000.

Boldizer, Leslie: *See*—
Jacobs, William, III; Luciw, Fred W.; Kancans, Ilze B.; Thomas, Daniel W.; Boldizer, Leslie; and Lees, Robert G., 5,180,835, Cl. 548-303.400.

Bolognesi, Massimo: *See*—
Boffito, Claudio; and Bolognesi, Massimo, 5,180,568, Cl. 423-248.000.

Bommer, Ulrich; and Schairer, Werner, to Telefunken electronic GmbH. Infrared light emitting diode with grading. 5,181,084, Cl. 257-94.000.

Bond, Robert D.; and Denham, Thomas E., to Raycon Corporation. Method and apparatus for non-contact machining with dynamic feedback control. 5,181,177, Cl. 364-474.040.

Bonini, Julius J.: *See*—
Rostoker, William, deceased; Rostoker, Gareth; Bonini, Julius J.; and Klimczak, Gary W., 5,180,421, Cl. 75-414.000.

Bontems, Maurice: *See*—
Bauer, Jean-Michel; and Bontems, Maurice, 5,180,459, Cl. 156-89.000.

Book, Steven C., to Auto-Shade, Inc. Easily stored infant pillow and blanket. 5,179,741, Cl. 5-417.000.

Borden, Inc.: *See*—
Gerber, Arthur H., 5,180,795, Cl. 525-504.000.

Bordino, Christian: *See*—
Gelin, Claude; and Bordino, Christian, 5,180,314, Cl. 439-394.000.

Borel, Christian: *See*—
Kump, Wilhelm; Borel, Christian; Chen, Jen; Veenstra, Siem J.; Francis, John; and Mugrage, Benjamin B., 5,180,718, Cl. 514-183.000.

Borg-Warner Automotive, Inc.: *See*—
Haley, William J.; and Swanson, Glenn E., 5,180,339, Cl. 474-28.000.

Bornand, Etienne: *See*—
Paratte, Lionel; Bornand, Etienne; and Racine, Georges-Andre , 5,180,940, Cl. 310-40.0MM.

Borovinskaya, Inna P.: *See*—
Merzhanov, Alexandr G.; Xandopulo, Georgy I.; Nersesian, Mikael D.; Ismailov, Marat B.; and Borovinskaya, Inna P., 5,180,698, Cl. 501-132.000.

Bortins, John: *See*—
Yan, Ying D.; Bortins, John; Keel, Beat G.; and Amin, Nurul, 5,181,152, Cl. 360-126.000.

Borzakian, Vartkes. Method of forming plastic piling. 5,180,531, Cl. 264-45.300.

Bose Corporation: *See*—
Holl, Timothy, 5,181,247, Cl. 381-24.000.
Sapiejewski, Roman; and Breen, John J., 5,181,252, Cl. 381-187.000.

Boss, Roland: *See*—
Thuer, Markus; Stucki, Gerhard; and Boss, Roland, 5,180,495, Cl. 210-605.000.

Bossenmaier, Alban: *See*—
Muller, Manfred; Henseler, Wolfgang; Katz, Egon; Bossenmaier, Alban; and Hamm, Dietrich, 5,180,187, Cl. 280-732.000.

Boucher, Jeffrey E.; and Pancheri, Eugene J., to Procter & Gamble Company, The. Granular detergent compositions having low levels of potassium salt to provide improved solubility. 5,180,515, Cl. 252-135.000.

Boudreault, Guy: *See*—
Berube, Martin; Bilodeau, Julien; Paul, Marlene; Gaucher, Ronald; Cote, Germain; and Boudreault, Guy, 5,179,982, Cl. 141-20.000.

Bouffard, Leif E.: *See*—
Erickson, William R.; and Bouffard, Leif E., 5,180,569, Cl. 423-319.000.

Bourgeois, Edmund B. Filter cartridge having internal liquid trap. 5,180,489, Cl. 210-238.000.

Bourjot, Joel: *See*—
Lerot, Luc; Legrand, Franz; and Bourjot, Joel, 5,180,693, Cl. 501-12.000.

Bowie, John M.: *See*—
Frey, Max; Livermore, Richard S.; and Bowie, John M., 5,179,881, Cl. 83-98.000.

Bowles, Donald C.: *See*—
Bagshaw, John M.; and Bowles, Donald C., 5,181,013, Cl. 340-702.000.

Bowles, Stephen A.; Whittaker, Mark; and Miller, Andrew, to British Bio-Technology Limited. Carboxamide amino acid heterobicyclic PAF antagonists. 5,180,724, Cl. 514-248.000.

Bowles, Stephen A.: *See*—
Whittaker, Mark; Miller, Andrew; and Bowles, Stephen A., 5,180,723, Cl. 514-234.200.

Bowman, Timothy S.; and Nufer, Heidi W., to Butler Manufacturing Company. Floor box. 5,180,074, Cl. 220-3.800.

Boyette, Scott M.: *See*—
Chen, Fu; Boyette, Scott M.; and Bair, Keith A., 5,180,498, Cl. 210-697.000.

Braams, Johannes F. H.; and Reynhout, Marinus J., to Shell Oil Company. Dewaxing process. 5,180,483, Cl. 208-28.000.

Bracco, Angelo A.: *See*—
Renlund, Gary M.; Lewis, Larry N.; Stein, Judith; and Bracco, Angelo A., 5,180,694, Cl. 501-12.000.

Braden, Rudolf: *See*—
Schwarz, Hans-Helmut; Braden, Rudolf; Marhold, Albrecht; and Negele, Michael, 5,180,861, Cl. 570-160.000.

Bradshaw, Gary D.: *See*—
Stokes, Barry O.; Bradshaw, Gary D.; and Barlow, Wayne K., 5,180,606, Cl. 427-2.000.

Brady, William J. Rotary mining tools. 5,180,022, Cl. 175-430.000.

Brame, Warren L., to Hosokawa Micron Australia Pty. Ltd. Blow tube removal. 5,180,110, Cl. 239-566.000.

Brandner, Gerhard; and Wegerer, Tanja, to Siemens Aktiengesellschaft. Method for manufacturing a luminescent storage screen having a phophor which is transparent to read-out radiation. 5,180,610, Cl. 427-64.000.

Brandt, Uwe. Ground connection for the spark plugs of a multi-cylinder internal-combustion vehicle engine. 5,180,313, Cl. 439-125.000.

Branecky, George N.; and Pezzuti, John F., to Pitney Bowes Inc. Grooved paper folding rollers. 5,180,151, Cl. 270-45.000.

Brantingham, Charles R. Shoe sole with randomly varying support pattern. 5,179,792, Cl. 36-29.000.

Braswell, Kenneth: *See—*
Walker, William H.; and Braswell, Kenneth, 5,179,811, Cl. 52-287.000.

Braun Corporation, The: *See—*
Czech, Edward A.; Goodrich, Ronald W.; and Crawford, Kevin L., 5,180,275, Cl. 414-541.000.

Braun, E.; and Wojciechowski, Jurgen, to PLAKOMA Planungen und Konstruktionen von maschinellen Einrichtungen GmbH. Apparatus for removing burrs from metallic workpieces. 5,179,772, Cl. 29-81.050.

Braun, Rolf: *See—*
Steiner, Gerd; Weniger, Rudi; Braun, Rolf; Otterbach, Rainer; Schubert, Erhard; and Hofmann, Ralf, 5,181,257, Cl. 382-17.000.

Brausfeld, Walter: *See—*
Moller, Rudolf; Brausfeld, Walter; Gottling, Helmut; Scharnowski, Gerhard; and Muller, Peter, 5,180,318, Cl. 439-716.000.

Breen, John J.: *See—*
Sapiejewski, Roman; and Breen, John J., 5,181,252, Cl. 381-187.000.

Breidenbach, James H.: *See—*
Foster, L. Dale; and Breidenbach, James H., 5,179,744, Cl. 5-600.000.

Brendle, Robert L.: *See—*
Rowland, Bob G.; Monigold, George E., Jr.; Brendle, Robert L.; and Rosse, Francis V., 5,180,647, Cl. 429-252.000.

Brennan, James L.: *See—*
Timberlake, Larry D.; and Brennan, James L., 5,180,859, Cl. 568-946.000.

Brennecke, Hermann; and Liere, Horst, to Alfo AG. Fiber optical waveguide having an electrically conductive connection. 5,181,266, Cl. 385-78.000.

Bresin, Mark S.; Aksoy, Adnan; and Robinson, Michael, to Motorola, Inc. Weldless battery pack. 5,180,644, Cl. 429-98.000.

Brewer, Michael H.: *See—*
Vassiliadis, Arthur; Shaffer, Joseph W.; Fullmer, David J.; Brewer, Michael H.; Hennings, David R.; and Myers, Terry D., 5,180,304, Cl. 433-224.000.

Bricker, Jacob L.: *See—*
Lind, Harold V.; Fried, Walter R.; and Bricker, Jacob L., 5,181,041, Cl. 342-453.000.

Bricker, Jeffery C.: *See—*
Frame, Robert R.; Bricker, Jeffery C.; Stine, Laurence O.; and Verachtert, Thomas A., 5,180,484, Cl. 208-189.000.

Bridgestone Corporation: *See—*
Fukasawa, Fumiaki; and Ikeda, Hiromichi, 5,180,453, Cl. 152-209.00R.
Honbo, Yoichi; Yoshizaki, Satoshi; and Iwasaki, Motohiro, 5,180,457, Cl. 152-541.000.
Watanabe, Isao; Rensel, John D.; and Weitzenhof, David A., 5,180,145, Cl. 267-64.240.
Yasunaga, Kuniaki; and Ueno, Shigeru, 5,180,755, Cl. 521-116.000.

Briggs, David H.; and Freeman, Richard F., to Unilever Patent Holdings B.V. Microwave heating apparatus. 5,180,895, Cl. 219-10.55F.

Brilcut Patentanstalt: *See—*
Leibowitz, Alec; and Cooke, Peter, 5,179,931, Cl. 125-30.010.

British Bio-Technology Limited: *See—*
Bowles, Stephen A.; Whittaker, Mark; and Miller, Andrew, 5,180,724, Cl. 514-248.000.
Whittaker, Mark; Miller, Andrew; and Bowles, Stephen A., 5,180,723, Cl. 514-234.200.

British Gas plc: *See—*
Clough, Peter S.; Yeowart, Richard J.; and Moore, Mansel, 5,179,752, Cl. 14-73.000.

British Nuclear Fuels plc: *See—*
Brown, David J., 5,180,542, Cl. 376-272.000.
Holderness, Stewart G., 5,180,526, Cl. 252-631.000.

British Telecommunications public limited company: *See—*
Jenkins, Peter D., 5,181,271, Cl. 385-135.000.

Bromine Compounds, Ltd.: *See—*
Shorr, Leonard M.; Fishler, Theodor M.; Yanay, Shaul; and Rumack, Michael, 5,180,787, Cl. 525-282.000.

Brooks Automation, Inc.: *See—*
Hendrickson, Ruth A., 5,180,276, Cl. 414-752.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Hayakawa, Atsuya, 5,181,176, Cl. 364-470.000.

Brower, William S., to Belvedere Sports. Portable sport boundary fence. 5,180,143, Cl. 256-24.000.

Brown, Curtis M.: *See—*
Nolan, Christopher E.; Brown, Curtis M.; and DeVries, Jeffrey T., 5,180,266, Cl. 411-429.000.

Brown, David J., to British Nuclear Fuels plc. Container. 5,180,542, Cl. 376-272.000.

Brown, Dennis. Swimmers's safety belt. 5,180,321, Cl. 441-94.000.

Brown, Donna D.: *See—*
Brown, Johnny L.; and Brown, Donna D., 5,181,140, Cl. 359-507.000.

Brown, Gordon R.: *See—*
Babchuk, Victor E.; and Brown, Gordon R., 5,179,801, Cl. 49-58.000.

Brown, Howard J., to Contact Lens Corporation of America. Multifocal contact lens. 5,181,053, Cl. 351-161.000.

Brown, James G.: *See—*
LaVallee, James R.; Hilsenbeck, Jerry M.; Brown, James G.; Sumner, Roger A.; Zazzera, Andre C.; and Bailey, Dana A., 5,181,236, Cl. 379-67.000.

Brown, Johnny L.; and Brown, Donna D. Binocular shield. 5,181,140, Cl. 359-507.000.

Brown, Larry T., to Ford Motor Company. Turbine speed controller for an automatic transmission. 5,179,875, Cl. 74-866.000.

Brown, Robert L.; Codispoti, Thomas E.; and Dunaway, Kenneth W., to General Tire, Inc. Method and apparatus for buffing a tire sidewall. 5,179,806, Cl. 51-165.710.

Browne, Richard P. Golf hole collar. 5,180,162, Cl. 273-34.00R.

Brubaker, Daniel B., to Rei, Inc. Platelet cross matching. 5,180,661, Cl. 435-7.210.

Bruckenstein, Stanley; and Adinolfe, Nancy, to Research Foundation of State University of New York. Method and apparatus for compensation of double layer charging current in electrochemical cells. 5,180,968, Cl. 324-71.100.

Bruckner, Raimund; Keutgen, Peter; and Donner, Andreas, to Didier-Weke AG. Method and apparatus for inserting a pouring pipe into a mold of a continuous casting machine. 5,180,536, Cl. 266-44.000.

Brudermann, Uwe: *See—*
Heier, Manfred; Brudermann, Uwe; and Kipfelsberger, Christian, 5,180,621, Cl. 428-138.000.

Bruker Analytische Messtechnik GmbH: *See—*
Zeiger, Heinz, 5,180,982, Cl. 324-322.000.

Brunner, Hans-Georg: *See—*
Pissiotas, Georg; Moser, Hans; Brunner, Hans-Georg; and Steiner, Eginhard, 5,180,418, Cl. 504-193.000.

Bruns, David; and Benjamin, David, to University of Virginia Alumni Patents Foundation. Immunochemical assays for human amylase isoenzymes and related monoclonal antibodies, hydridoma cell lines and production thereof. 5,180,663, Cl. 435-7.400.

Bryant, David R.: *See—*
Abatjoglou, Anthony G.; Bryant, David R.; and Peterson, Ronald R., 5,180,854, Cl. 568-454.000.

Bryant, Frank R.; and Waters, John L., to SGS-Thomson Microelectronics, Inc. Method of forming tunneling diffusion barrier for local interconnect and polysilicon high impedance device. 5,180,688, Cl. 437-195.000.

Buchwald, Aaron W.: *See—*
Martin, Kenneth W.; and Buchwald, Aaron W., 5,180,994, Cl. 331-38.000.

Buechele, Franz; and Dipple, Stephen G., to Tridon Limited. Aerodynamic windshield wiper superstructure. 5,179,761, Cl. 15-250.420.

Buinevicius, Rimas P.; and Metzger, William, to Arzco Medical Electronics Inc. Electrocardial stimulator probe. 5,179,952, Cl. 128-642.000.

Burer, Aubrey M.: *See—*
Monsees, John C.; Crownover, Joseph W.; and Burer, Aubrey M., 5,179,773, Cl. 29-25.420.

Burge, Joseph C.; and Tiernan, Richard J., Jr., to United Technologies Corporation. Case tying means for gas turbine engine. 5,180,281, Cl. 415-209.200.

Burger, Ranier; and Riescher, Georg, to Man Roland Druckmaschinen AG. Tower printing system having multiple vertically stacked satellite printing stations. 5,179,899, Cl. 101-181.000.

Burke, James A., to Allergan, Inc. Combinations of selective alpha-adrenergic agonists and antagonists useful in lowering intraocular pressure. 5,180,721, Cl. 514-213.000.

Burkhardt, Gary L.: *See—*
Kwun, Hegeon; Burkhardt, Gary L.; and Fisher, Jay L., 5,180,969, Cl. 324-71.200.

Burnham, Ralph L.; Kasinski, Jeffrey J.; and Marshall, Larry R., to Fibertek, Inc. Eye-safe laser system. 5,181,211, Cl. 372-21.000.

Burns, James R.; and Blaski, Marvin F., to Rockwell International Corporation. Battery cell bypass circuit. 5,180,641, Cl. 429-1.000.

Busch, Jeffrey W.: *See—*
Marshall, Roger N.; Hauck, Lane T.; Shapiro, Leonid; Busch, Jeffrey W.; and Stevens, Eric S., 5,181,015, Cl. 340-706.000.

Butler Manufacturing Company: *See—*
Bowman, Timothy S.; and Nufer, Heidi W., 5,180,074, Cl. 220-3.800.

Butts, Nelson L.: *See—*
McCrillis, Robert C.; Butts, Nelson L.; Ponder, Wade H.; and Abbott, James H., 5,179,933, Cl. 126-77.000.

C. & E. Fein GmbH & Co.: *See—*
Schreiber, Wolfgang, 5,180,261, Cl. 408-239.00R.

Cabri, Walter; Candiani, Ilaria; De Bernardinis, Silvia; and Francalanci, Franco, to Farmitalia Carlo Erba S.r.l. Process for preparing anthracyclinones. 5,180,758, Cl. 552-201.000.

Caceres, Roberto. Recreational cart. 5,180,178, Cl. 280-47.340.

Cahill, Michael J.; Patchett, Jeffrey J.; Seaward, David R.; Shirley, Graham L.; and Vernon, Geoffrey W., to Molins PLC. Article wrapping apparatus. 5,179,815, Cl. 53-133.300.

Caimi, Frank M.: *See—*
Grossman, Barry G.; and Caimi, Frank M., 5,180,911, Cl. 250-227.210.

Calamia, David C.; Binversie, Gregory J.; and Petersen, H. Norman, to Outboard Marine Corporation. Trim switch for tiller-steered outboard. 5,180,320, Cl. 440-61.000.

Caledon Riviersonderend Kooperasie Beperk: *See*—
Van Niekerk, Johannes A., 5,179,859, Cl. 73-864.640.

Call, Jon: *See*—
DiDio, Gary M.; Jones, Kermit; Hoffman, Kevin; Laarman, Timothy; Call, Jon; and Nath, Prem, 5,180,434, Cl. 118-718.000.

Callaway Golf Company: *See*—
Schmidt, Glenn H.; Sheehan, John P.; and Helmstetter, Richard C., 5,180,166, Cl. 273-167.00F.

Cambelt International Corporation: *See*—
Campbell, David R., 5,180,272, Cl. 414-313.000.

Cambridge Consultants Limited: *See*—
Oswald, Gordon K. A.; Neal, Christopher S.; and Richardson, Alan T., 5,181,039, Cl. 342-119.000.

Campbell, David R., to Cambelt International Corporation. Device and method for outloading bulk materials. 5,180,272, Cl. 414-313.000.

Canada, Her Majesty the Queen in right of Canada, as represented by The National Research Council of: *See*—
Holmes, Charles, 5,180,665, Cl. 435-21.000.

Candiani, Ilaria: *See*—
Cabri, Walter; Candiani, Ilaria; De Bernardinis, Silvia; and Francalanci, Franco, 5,180,758, Cl. 552-201.000.

Cannon, Robert W., to Marmon Corporation of Canada, Ltd., The. Method and apparatus for incubating and hatching eggs. 5,179,913, Cl. 119-43.000.

Canon Kabushiki Kaisha: *See*—
Egawa, Akira, 5,181,058, Cl. 354-105.000.
Kazumi, Jiro, 5,181,062, Cl. 354-412.000.
Koide, Jun, 5,181,137, Cl. 359-217.000.
Kukimoto, Tsutomu; Yusa, Hiroshi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; and Kuwashima, Tetsuhito, 5,180,649, Cl. 430-106.600.
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Masu, Kazuya, 5,180,687, Cl. 437-187.000.
Noguchi, Kazuhiro; Ogino, Shigeru; and Kobayashi, Takashi, 5,181,056, Cl. 354-70.000.
Saito, Tetsuya, 5,180,235, Cl. 400-167.000.
Seki, Hiroyuki; and Kimura, Atsushi, 5,180,941, Cl. 310-323.000.
Shindo, Hitoshi; and Nakayama, Jun, 5,181,132, Cl. 359-58.000.
Sugishima, Kiyohisa; and Nishio, Masahiro, 5,181,104, Cl. 358-75.000.
Touge, Yoshiyuki; and Yoneyama, Yoshito, 5,180,065, Cl. 209-577.000.
Udagawa, Yoshiro; and Takiguchi, Hideo, 5,181,105, Cl. 358-80.000.

Canova, Paola, to Ciba-Geigy Corporation. Stabiliser composition for polypropylene, comprising triazine compounds containing piperidine groups, and metal compounds. 5,180,762, Cl. 524-100.000.

Cantrell, Robert W.: *See*—
Sparrow, James A.; and Cantrell, Robert W., 5,180,549, Cl. 376-445.000.

Cantwell, Robert H., to Raytheon Company. Threshold level generator. 5,181,226, Cl. 375-1.000.

Capdevila Mas, Juan. Magnetic latchkey. 5,179,850, Cl. 70-276.000.

Carapace: *See*—
Edenbaum, Martin; Frisch, Kurt C.; Sendijarevic, Aisa; and Wong, Shaio-wen, 5,180,632, Cl. 428-253.000.

Carcano, Mario; and Costa, Massimo, to Aesculapius-Pharma S.A. Process for the preparation of anti-inflammatory pharmaceutical agents with an ibuprofen base, with elimination, in solution, of the bitter taste, burning of the throat and intestinal toxicity. 5,180,590, Cl. 424-466.000.

Cardiac Pacemakers, Inc.: *See*—
Meyerson, Scott C.; Linder, William J.; and Maile, Keith R., 5,179,947, Cl. 128-419.0PG.
Van Hofwegen, Lloyd; Hsung, Jean-Cheui; and Huntwork, Daniel, 5,179,945, Cl. 128-419.00D.

Carduck, Franz-Josef: *See*—
Fleckenstein, Theo; Goebel, Gerd; Carduck, Franz-Josef; Demmering, Guenther; and Kubersky, Hans-Peter, 5,180,858, Cl. 568-885.000.

Carey, Clifton. Phosphate selective composition and electrode. 5,180,481, Cl. 204-416.000.

Carlier, Patrick; Combourieu, Michel; Poisson, Claude; and Monteil, Andre J., to Akzo N.V. 4-[4- or 6-(trifluoromethyl-2-pyridinyl)]-1-piperazinylalkyl substituted lactams. 5,180,726, Cl. 514-252.000.

Carlson, Bradley D.: *See*—
Swartz, Harold L.; Stansberry, Warren W.; Heidel, Jeffrey C.; and Carlson, Bradley D., 5,180,986, Cl. 324-660.000.

Carlson, Douglas W.; and Simons, Stephen P., to Hydril Company. Ram type blowout preventer having improved ram front packings. 5,180,137, Cl. 251-1.300.

Carlson, Michael A. Gel dispenser apparatus for expressing a flammable gel. 5,180,083, Cl. 222-185.000.

Carrier Corporation: *See*—
Gilbert, Jeffrey S.; and Desmarais, Brett A., 5,180,102, Cl. 236-49.300.
Phillips, Thomas R.; Dewolf, Thomas L.; and Bench, Ronald W., 5,179,841, Cl. 62-81.000.

Carriere, Donald L., to Ford Motor Company. T-drive powertrain assembly for automotive vehicle with forward disposition of the axis for the forward traction wheels. 5,180,346, Cl. 475-200.000.

Cartere, Peter: *See*—
Birtwistle, David H.; Cartere, Peter; and Rosser, David A., 5,180,579, Cl. 424-70.000.

Carty, Daniel T.: *See*—
Parr, James P.; and Carty, Daniel T., 5,180,514, Cl. 252-99.000.

Carver, Edward L., Jr.: *See*—
Di Ianni, Ludmilla P.; and Carver, Edward L., Jr., 5,180,677, Cl. 436-17.000.

CAS Medical Systems, Inc.: *See*—
Williams, Michael, 5,179,957, Cl. 128-686.000.

Cascio, Jack; Ivanov, Konstantin; Alpern, Marvin; Cerwin, Robert; and Siernos, Joseph, to Ethicon, Inc. Cantilevered needle park. 5,180,053, Cl. 206-63.300.

Case Corporation: *See*—
Van Ee, Marvin D., 5,180,342, Cl. 474-123.000.

Casey, Todd A.; and Jackson, Alan D., to Eaton Corporation. Brake valve for use in load sensing hydraulic system. 5,179,835, Cl. 60-386.000.

Casilli, Nicola; Crisci, Luciana; Renzi, Fiorenzo; and Rivetti, Franco, to Enichem Synthesis S.p.A. Photochromatic composition and photochromatic articles which contain it. 5,180,524, Cl. 252-586.000.

Casio Computer Co., Ltd.: *See*—
Kanzaki, Takashi, 5,181,190, Cl. 368-76.000.
Ohtani, Yuji, 5,181,273, Cl. 395-161.000.
Sugiyama, Kazuhiro; and Atsumi, Yoshinori, 5,180,888, Cl. 174-94.00R.

Casutt, Michael: *See*—
Heywang, Ulrich; Casutt, Michael; and Schwarz, Michael, 5,180,837, Cl. 548-315.400.

Caterpillar Inc.: *See*—
Kouzel, Richard L.; Penn, Aubery W.; Jensen, Brian D.; and Dicke, Paul A., 5,180,003, Cl. 165-121.000.

Cathco, Inc.: *See*—
Fischell, Robert E., 5,180,376, Cl. 604-282.000.

Cavallotti, Claudio: *See*—
Venturello, Carlo; and Cavallotti, Claudio, 5,180,516, Cl. 252-186.100.

Cavazza, Claudio, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Crystalline magnesium valporate and a method for the preparation thereof. 5,180,850, Cl. 562-606.000.

Cavender, Ralston R., Jr.: *See*—
Backer, Marcella R.; Cavender, Ralston R., Jr.; Jones, Peter C.; and Murphy, James A., 5,180,411, Cl. 65-3.120.

Caveney, Robert D. Apparatus for loading a trash bag with debris from the ground. 5,180,125, Cl. 248-99.000.

Cayre, Yvon, to Columbia University in the City of New York, The Trustees of. Purified myeloblastin, nucleic acid molecule encoding same, and uses thereof. 5,180,819, Cl. 536-23.200.

Cech, Thomas R.; and Herschlag, Daniel, to University of Colorado Foundation, Inc., The. Site specific cleavage of single-stranded DNA. 5,180,818, Cl. 536-23.100.

Cegelec: *See*—
Gelin, Claude; and Bordino, Christian, 5,180,314, Cl. 439-394.000.

Celaya, Richard J. Tohiti Rattan Police Baton. 5,180,164, Cl. 273-84.00R.

Centercore, Inc.: *See*—
Mitchell, George E.; and Pelosi, Michael H., III, 5,180,332, Cl. 454-230.000.

Centocor: *See*—
Dean, Richard T., 5,180,816, Cl. 530-404.000.

Cerwin, Nicholas: *See*—
Finkl, Charles W.; and Cerwin, Nicholas, 5,180,444, Cl. 148-660.000.

Cerwin, Robert: *See*—
Cascio, Jack; Ivanov, Konstantin; Alpern, Marvin; Cerwin, Robert; and Siernos, Joseph, 5,180,053, Cl. 206-63.300.

Cerwin, Robert J.: *See*—
Kalinski, Robert J.; Cerwin, Robert J.; and Alpern, Marvin, 5,179,818, Cl. 53-430.000.

Cessna, Frank L., to Sorg Paper Company, The. Method for the manufacture of anti-static sheets for use in high pressure laminates. 5,180,472, Cl. 162-138.000.

Cha, Dong-il, to Samsung Electronics Co., Ltd. Preheated thermal print apparatus for video printer. 5,181,048, Cl. 346-76.0PH.

Chadima, George E., Jr.; and Schultz, Darald R., to Norand Corporation. Modular printer system. 5,180,232, Cl. 400-88.000.

Champion, Stephen E.; and Philliber, Robert A. Orientable stabilizer. 5,180,021, Cl. 175-76.000.

Champlain Cable Corporation: *See*—
Aldissi, Mahmoud, 5,180,884, Cl. 174-36.000.

Chance, Christopher N.; DeBlasio, James A.; Evers, Donald H.; Harris, William C., Jr.; Kirby, Michael A., Sr.; Newsome, Reginald W.; and Talley, Robert E., to Philip Morris Incorporated. Method of attaching two half-cartons and the product. 5,180,055, Cl. 206-256.000.

Chance, Christopher N.: *See*—
Adams, John M.; Chance, Christopher N.; DeBlasio, James A.; Evers, Donald H.; Kirby, Michael A., Sr.; Newsome, Reginald W.; and Talley, Robert E., 5,180,056, Cl. 206-256.000.

Chang, Jeffrey C.: *See*—
Smith, Terrance P.; Macomber, David W.; Chang, Jeffrey C.; and Williams, Linda K., 5,180,705, Cl. 503-227.000.

Chang, Shih-Ho. Clipboard having a calculator mounted thereon. 5,180,133, Cl. 248-452.000.

Chapman, Daniel H., to Harris Corp. Error correction mechanism using pattern predictive error correction codes. 5,181,207, Cl. 371-37.400.

Charles, Harlan W.; and Miller, Larry D., to General Motors Corporation. Strut and method for steer-sensitive damping. 5,180,186, Cl. 280-714.000.

Chazono, Hirokazu; Honda, Mutsumi; Kisi, Hirosi; Saito, Hirosi; and Shizuno, Hisamitsu, to Taiyo Yuden Kabusikigaisha. Ceramic capacitor and method for fabricating the same. 5,181,157, Cl. 361-321.000.

Cheeng Iu Industrial Co., Ltd.: *See*—
Wang, Mao-Hsiung, 5,179,849, Cl. 70-209.000.

Chen, Fu; Boyette, Scott M.; and Bair, Keith A., to Betz Laboratories, Inc. Polymers for the treatment of boiler water. 5,180,498, Cl. 210-697.000.

Chen, Harold; Anglin, Noah L.; and Hludzinski, Stanley J., to VeriFone Inc. Card reader apparatus with replaceable card guide. 5,180,905, Cl. 235-483.000.

Chen, Hsi-Lin. Controlling device with a road condition display for an exercise bicycle. 5,180,347, Cl. 482-5.000.

Chen, Jen: *See*—
Kump, Wilhelm; Borel, Christian; Chen, Jen; Veenstra, Siem J.; Francis, John; and Mugrage, Benjamin B., 5,180,718, Cl. 514-183.000.

Chen, Ting-Hsing, to Far Great Plastics Industrial Co., Ltd. Elastic truck for roller skates. 5,180,176, Cl. 280-11.280.

Chen, Tu: *See*—
Yamashita, Tsutomu T.; Nguyen, Phuong; and Chen, Tu, 5,180,640, Cl. 428-611.000.

Chen, Tzung-Wen. Pepper grinder. 5,180,114, Cl. 241-169.100.

Chen, Yen-Chin, to Getac Corporation. Keyboard for under water use. 5,180,237, Cl. 400-479.000.

Cheney, M. Charles: *See*—
Jeannotte, Anthony C.; Gilby, Anthony C.; Cheney, M. Charles; and Meneghelli, Barry J., 5,181,082, Cl. 356-436.000.

Cheng, Ying-Hsung. Pneumatic tire and improved inflation and deflation valve device. 5,180,455, Cl. 152-338.100.

Cherfane, Raymond, to Flexible Products Company. Foam dispensing gun with improved dispenser module. 5,180,082, Cl. 222-145.000.

Chesapeake Display and Packaging Company: *See*—
Smith, Raymond D.; and Reckers, Janet A., 5,180,052, Cl. 206-45.110.

Chesebrough-Pond's USA Co., division of Conopco, Inc.: *See*—
Birtwistle, David H.; Cartere, Peter; and Rosser, David A., 5,180,579, Cl. 424-70.000.

Chesler, Ronald B.: *See*—
Hsu, Hui-Pin; and Chesler, Ronald B., 5,181,270, Cl. 385-134.000.

Chevron Chemical Company: *See*—
Omid, Ahmad, 5,180,415, Cl. 504-299.000.

Chevron Research & Technology Company: *See*—
Copeland, James R., 5,179,896, Cl. 101-6.000.
Petroff, Larry J.; and Miller, James H., 5,180,195, Cl. 285-231.000.

Chi Chang Enterprises Co., Ltd.: *See*—
Kuan, Chen, 5,180,405, Cl. 55-227.000.

Chiaretti, Guido; and Blandano, Francesco, to Italtel Societa Italiana Telecomunicazioni S.p.A. Transceiver for bidirectional signal transmission over a monomodal optical fiber. 5,181,264, Cl. 385-33.000.

Chiba, Katsuyoshi; Katsumoto, Masayuki; Uesaka, Yasutaro; Fukke, Hajime; Ishihara, Heigo; Matsuyama, Iwao; Kodama, Naoki; Inoue, Hitoshi; and Terada, Yoshiharu, to Hitachi, Ltd. Process for producing a rigid magnetic disk by longitudinally generating standing waves or interference waves in an undried applied magnetic paint. 5,180,608, Cl. 427-560.000.

Chichester, Dennis B.: *See*—
Allread, Alan R.; Chichester, Dennis B.; Rogers, Russell L.; and Knowles, Steven M., 5,180,194, Cl. 285-166.000.

Chick, James S. Automotive security system with discrimination between tampering and attack. 5,181,010, Cl. 340-426.000.

Chidiiwa, Sakae: *See*—
Morishima, Satoshi; and Chidiiwa, Sakae, 5,180,561, Cl. 422-191.000.

Chien, Ching-Kee, to Corning Incorporated. Strippable tight buffered optical waveguide fiber. 5,181,268, Cl. 385-128.000.

Chiesa, Pierina: *See*—
Joshi, Yatindra M.; Chiesa, Pierina; and Jain, Nemichand B., 5,180,589, Cl. 424-465.000.

Chirife, Raul. Cardiac pacemaker with automatic A-V programming for optimization of left heart A-V interval. 5,179,949, Cl. 128-419.0PG.

Chisso Corporation: *See*—
Ishibashi, Tadao; and Yamada, Kazuhiro, 5,180,626, Cl. 428-213.000.
Uchida, Manabu; Ushioda, Makoto; and Goto, Yasuyuki, 5,180,519, Cl. 252-299.630.

Chiu, Hsiu-Hui, to Sunshon Molding Co., Ltd. Collapsible three-stage golf cart. 5,180,184, Cl. 280-646.000.

Chiu, Yao-Jui, to Great Health, Enrich Life China Tasty Food Co., Ltd. Oil supplying and recycling equipment for a vacuumized frying apparatus. 5,179,891, Cl. 99-408.000.

Choi, Hae Y.; and Lee, Joon H., to Samsung Electronics Co., Ltd. Automatic contrast controller of a video camera. 5,181,117, Cl. 358-169.000.

Choi, Yun-ho, to Samsung Electronics Co., Ltd. Constant voltage generation of semiconductor device. 5,180,928, Cl. 307-296.600.

Chong, Wesley K. M.: *See*—
Avery, Mitchell A.; and Chong, Wesley K. M., 5,180,840, Cl. 549-348.000.

Choshitani, Hitoshi; Osaka, Takahide; Itojima, Fumiaki; and Yasuda, Masashi, to Tokkyo Kiki Kabushiki Kaisha. Active control precision damping table. 5,180,958, Cl. 318-623.000.

Chow, Hong-Jien; and Jian, Yi-Min. Aquarium having a cleaning apparatus. 5,179,911, Cl. 119-5.000.

Choy, Jung-Soo. Golf swing aid. 5,180,169, Cl. 273-189.00A.

Christian, Donald J.; Robertson, Graham D.; Tucci, James M.; and Westcott, Michael J., to FMC Corporation. Apparatus for deicing. 5,180,122, Cl. 244-134.00F.

Christopher, Gary L., to Eaton Corporation. Electrically controlled shift actuator. 5,180,959, Cl. 318-626.000.

Chrysler Corporation: *See*—
Behrens, William L.; and Anderson, Arthur, 5,179,870, Cl. 74-475.000.

Chu, Ang-Ling: *See*—
Durand, David; Vieau, David P.; Chu, Ang-Ling; and Weiu, Tai S., 5,180,523, Cl. 252-512.000.

Chugoku Marine Paints, Ltd.: *See*—
Kitayama, Minoru; Morifusa, Harumi; and Kondoh, Katsumi, 5,180,776, Cl. 525-64.000.

Chung, Yun C.; DiGiovanni, David J.; Stone, Julian; Sulhoff, James W.; and Zyskind, John L., to AT&T Bell Laboratories. Electrically tunable fiber ring laser. 5,181,210, Cl. 372-6.000.

Church & Dwight Co., Inc.: *See*—
Winston, Anthony E.; Miskewitz, Regina M.; Walley, Darlene R.; and Berschied, John R., 5,180,576, Cl. 424-52.000.

Ciba-Geigy Corporation: *See*—
Canova, Paola, 5,180,762, Cl. 524-100.000.
Cunkle, Glen T.; Ravichandran, Ramanathan; and Sabrsula, Donald J., 5,180,829, Cl. 546-188.000.
Grutter, Markus G.; Heinz, Dirk; and Liersch, Manfred, 5,180,667, Cl. 435-69.200.
Kump, Wilhelm; Borel, Christian; Chen, Jen; Veenstra, Siem J.; Francis, John; and Mugrage, Benjamin B., 5,180,718, Cl. 514-183.000.
Manz, Andreas, 5,180,480, Cl. 204-299.00R.
Pissiotas, Georg; Moser, Hans; Brunner, Hans-Georg; and Steiner, Eginhard, 5,180,418, Cl. 504-193.000.
Thuer, Markus; Stucki, Gerhard; and Boss, Roland, 5,180,495, Cl. 210-605.000.

Cicatello, Samuel; and Macartney, Robert M., to General Motors Corporation. Strap feed assembly with floating back-up wheels. 5,179,892, Cl. 100-32.000.

Cielo, Paolo: *See*—
Moreau, Christian; Lamontagne, Mario; and Cielo, Paolo, 5,180,921, Cl. 250-554.000.

Cincinnati Milacron, Inc.: *See*—
Cropper, Dennis J.; O'Bryan, James E.; and Waits, Susan, 5,180,530, Cl. 264-40.500.

Citizen Watch Co., Ltd.: *See*—
Hibino, Hiromi; Hasegawa, Kazumi; Nishida, Koujiro; Abe, Kouzou; and Kurihara, Toshio, 5,180,238, Cl. 400-247.000.

Citta, Richard W.; Halozan, Scott F.; and Sgrignoli, Gary J., to Zenith Electronics Corporation. Television signal transmission system with carrier offset compensation. 5,181,112, Cl. 358-141.000.

City of Hope: *See*—
Bailey, Jerome M.; and Shively, John E., 5,180,807, Cl. 530-345.000.

Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; White, Danny R.; Johnson, William B.; and Aghajanian, Michael K., to Lanxide Technology Company, LP. Process for preparing self-supporting bodies and products produced thereby. 5,180,697, Cl. 501-96.000.

Clark, Russell L.: *See*—
Suman, Michael J.; Reed, Stewart D.; Frye, Dale J.; and Clark, Russell L., 5,180,089, Cl. 224-42.45R.

Clecim: *See*—
Vatant, Robert A.; Courbier, Michel F.; and Weiss, Andre , 5,180,538, Cl. 266-91.000.

Clorox Company, The: *See*—
Farr, James P.; and Carty, Daniel T., 5,180,514, Cl. 252-99.000.

Close, Richard C.; Gregory, H. Scott, Jr.; and Walker, Douglas G., to Eastman Kodak Company. Optical intermediate produced by a calibrated printe · for use in an electrophotographic copier to compensate for d terminable copier reproduction characteristics. 5,181,124, Cl. 3 8-300.000.

Clough, Peter S.; Yeowart, Richard J.; and Moore, Mansel, to British Gas plc. Cover for trenches. 5,179,752, Cl. 14-73.000.

Clutch, Dennis P : *See*—
Kessler, Wil am F.; Clutch, Dennis R.; and Kennedy, William J., 5,180,618, Cl. 428-100.000.

CMI International, Inc.: *See*—
Kuhn, John W., 5,179,994, Cl. 164-100.000.

Coatex S.A.: *See*—
Rousset, Jacky; and Ravet, Georges, 5,180,790, Cl. 525-329.600.

Coca-Cola Company, The: *See*—
Jarocki, George J.; and Drzewiecki, Tadeusz M., 5,179,970, Cl. 137-9.000.

Codispoti, Thomas E.: *See*—
Brown, Robert L.; Codispoti, Thomas E.; and Dunaway, Kenneth W., 5,179,806, Cl. 51-165.710.

Cody, Charles A.: *See*—
Hartman, Terrence L.; and Cody, Charles A., 5,180,802, Cl. 528-335.000.

COE Manufacturing Company (Canada), Inc., The: *See*—
Stroud, Brian T.; Maxwell, Grant D.; and Rohachuk, Ronald E., 5,179,789, Cl. 34-54.000.

Cogema: *See*—
Grattier, Bernard, 5,180,545, Cl. 376-352.000.

Cohausz, Helge S. Remote controlled robotic refrigerator. 5,179,843, Cl. 62-237.000.

Cole, James T.: *See*—
Alden, Lorne B.; Cole, James T.; Lockridge, James E.; and Costello, Thomas E., 5,180,898, Cl. 219-388.000.

Colgate-Palmolive: *See*—
Polefka, Thomas G.; Sanai, Deborah S.; and Jannone, Brian S., 5,180,577, Cl. 424-52.000.
Colgate-Palmolive Company: *See*—
Gaffar, Abdul; Nabi, Nuran; Afflitto, John; and Stringer, Orum, 5,180,578, Cl. 474-52.000.
Colin Electronics Co., Ltd.: *See*—
Harada, Chikao; Kawamura, Norio; Nakashima, Ryuji; Takahashi, Arihiro; Yamazaki, Toshimasa; Yasui, Masanobu; and Kondo, Tatsushi, 5,179,956, Cl. 128-672.000.
Collett, Donald E.: *See*—
Lanctot, Paul A.; and Collett, Donald E., 5,180,163, Cl. 273-72.00R.
Colling, Edwin L., Jr.: *See*—
Nolte, David G.; Haskin, Helen K.; and Colling, Edwin L., Jr., 5,180,556, Cl. 422-109.000.
Columbia University in the City of New York, The Trustees of: *See*—
Cayre, Yvon, 5,180,819, Cl. 536-23.200.
Combourieu, Michel: *See*—
Carlier, Patrick; Combourieu, Michel; Poisson, Claude; and Monteil, Andre J., 5,180,726, Cl. 514-252.000.
Commarmond, Jacques, to Polyclinique de Bourgogne & Les Hortensiad. Artificial ligament for the spine. 5,180,393, Cl. 623-13.000.
Compagnie Generale des Etablissements Michelin—Michelin & Cie: *See*—
Laurent, Daniel, 5,180,592, Cl. 425-46.000.
Compagnie Generale Des Matieres Nucleaires: *See*—
Verdier, Michel, 5,180,548, Cl. 376-439.000.
Conaway, Brian J.; and Keyes, Tyrone M., to Rubbermaid Incorporated. Shower caddy. 5,180,067, Cl. 211-119.000.
Confloat Consulting Ltd.: *See*—
Watchorn, Ernest W., 5,180,294, Cl. 417-516.000.
Conner Peripherals, Inc.: *See*—
Blanchette, Gregory J.; and Jessee, Paul E., 5,181,148, Cl. 360-99.080.
Conoco Inc.: *See*—
Fuh, Giin-Fa; Morita, Nobuo; Whitfill, Donald L.; and Strah, David A., 5,180,020, Cl. 175-72.000.
Contact Lens Corporation of America: *See*—
Brown, Howard J., 5,181,053, Cl. 351-161.000.
Continental Aktiengesellschaft: *See*—
Schneider, Eckhard; and Gawinski, Hubertus, 5,180,146, Cl. 267-64.270.
Conway, Lawrence E.; and Schulz, Terry L., to Westinghouse Electric Corp. Passive safety injection system using borated water. 5,180,543, Cl. 376-282.000.
Cook, Leonard, to Du Pont Merck Pharmaceutical Company. Use of sigma receptor antagonists for treatment of cocaine abuse. 5,180,729, Cl. 514-317.000.
Cook, Melvin S. Surgical stapling method. 5,179,964, Cl. 128-898.000.
Cook, Robert G.; Runyan, Daniel J.; Rezac, Willard J.; Edds, Thomas A.; and Bilas, Ronald J., to Square D Company. Remote control circuit breaker. 5,180,051, Cl. 200-400.000.
Cook, Roger D.; and Milina, Daniel V., to VLSI Technology, Inc. Etching system having simplified diffuser element removal. 5,180,467, Cl. 156-643.000.
Cooke, Peter: *See*—
Leibowitz, Alec; and Cooke, Peter, 5,179,931, Cl. 125-30.010.
Cookson, Gleason O.; Dang, Vu A.; and Raman, Krishna, to Himont Incorporated. Process for preparing hindered amine light stabilizers. 5,180,830, Cl. 546-222.000.
Coombs, Peter M., to Gradco (Japan) Ltd. Moving bin-set sorter. 5,180,158, Cl. 271-293.000.
Coon, Gerald A.; Reinhart, Douglas A.; and Ray, Lawrence D., to Findlay Industries. Inverting seat covers. 5,180,460, Cl. 156-93.000.
Cooper, Dennis B.: *See*—
Driscoll, Daniel F.; and Cooper, Dennis B., 5,180,270, Cl. 411-369.000.
Cooper, Gershon N., to Alliance Research Corporation. Passive repeater for cellular phones. 5,181,043, Cl. 343-713.000.
Cooper Power Systems, Inc.: *See*—
Boenitz, Maurice J.; and Denner, Harry T., 5,179,776, Cl. 29-609.000.
Copeland, James R., to Chevron Research & Technology Company. Indent printer for plastic pipe and method of use. 5,179,896, Cl. 101-6.000.
Cordner, Edward T., Jr.; Payne, Steven R.; and Istratoff, Glenn J., to Block Medical, Inc. Apparatus for filling multiple reservoir infusion systems. 5,179,983, Cl. 141-27.000.
Corner, Neil A.: *See*—
John, Laurence N.; and Corner, Neil A., 5,180,227, Cl. 374-131.000.
Corning Incorporated: *See*—
Backer, Marcella R.; Cavender, Ralston R., Jr.; Jones, Peter C.; and Murphy, James A., 5,180,411, Cl. 65-3.120.
Berkey, George E., 5,180,410, Cl. 65-3.110.
Chien, Ching-Kee, 5,181,268, Cl. 385-128.000.
Cornwall, Mickey; Peterson, David M.; and Stern, Theodore G., to General Dynamics Corporation/Space Systems Division. Solar concentrator array. 5,180,441, Cl. 136-246.000.
Costa, Massimo: *See*—
Carcano, Mario; and Costa, Massimo, 5,180,590, Cl. 424-466.000.
Costello, Bernard J., to Argus International. Method for irradiation of printed wiring boards and the like. 5,180,611, Cl. 427-96.000.
Costello, Thomas E.: *See*—
Alden, Lorne B.; Cole, James T.; Lockridge, James E.; and Costello, Thomas E., 5,180,898, Cl. 219-388.000.
Cote, Germain: *See*—
Berube, Martin; Bilodeau, Julien; Paul, Marlene; Gaucher, Ronald; Cote, Germain; and Boudreault, Guy, 5,179,982, Cl. 141-20.000.
Cotteret, Jean: *See*—
Grollier, Jean F.; Cotteret, Jean; and Garoche, Didier, 5,180,396, Cl. 8-405.000.
Grollier, Jean F.; Cotteret, Jean; and Garoche, Didier, 5,180,397, Cl. 8-405.000.
Grollier, Jean F.; Cotteret, Jean; and Garoche, Didier, 5,180,399, Cl. 8-405.000.
Cotton, David R.: *See*—
Mosher, Dan M.; Latham, Larry; Todd, Bob; Blanton, Cornelia H.; Trogolo, Joe R.; and Cotton, David R., 5,181,095, Cl. 257-370.000.
Coulie, Pierre: *See*—
Druez, Catherine; Coulie, Pierre; Uyttenhove, Catherine; and Van Snick, Jacques, 5,180,678, Cl. 436-501.000.
Coupleux, Louis: *See*—
Delepierre, Bertrand; and Coupleux, Louis, 5,180,330, Cl. 454-64.000.
Cour, Marie M. H.; and Vernieres, Raymond F. J., to Siemens Aktiengesellschaft. Internal combustion engine ignition device. 5,179,928, Cl. 123-606.000.
Courbier, Michel F.: *See*—
Vatant, Robert A.; Courbier, Michel F.; and Weiss, Andre , 5,180,538, Cl. 266-91.000.
Cova, Mario: *See*—
Lepori, Agostino; Zavatteri, Ignazio; and Cova, Mario, 5,180,770, Cl. 524-563.000.
Cowie, Theo D.; Malan, John M.; and Thomas, Malcolm W., to Threshold Control Systems CC. Access control booth with arcuate doors. 5,181,018, Cl. 340-825.310.
Cox, Don C., to Otis Engineering Corporation. System for deploying submersible pump using reeled tubing. 5,180,014, Cl. 166-384.000.
Cox, Robert G., Jr.: *See*—
Thomas, Dennis A.; Goulait, David J. K.; and Cox, Robert G., Jr., 5,180,534, Cl. 264-145.000.
CPC International Inc.: *See*—
Hamm, Donald J., 5,180,597, Cl. 426-52.000.
Crainich, Lawrence. Linear surgical stapling instrument. 5,180,092, Cl. 227-180.000.
Crane, Lori A.; Hynes, John T.; Guth, Jules H.; and Strandholm, John J., to Kraft General Foods, Inc. Non-fat cream cheese product and method for manufacture thereof. 5,180,604, Cl. 426-582.000.
Crause, Peter; Habermann, Paul; and Tripier, Dominique, to Hoechst Aktiengesellschaft. Hirudin derivative. 5,180,668, Cl. 435-69.200.
Crawford, James B. Method for carrying tool on coil tubing with shifting sub. 5,180,012, Cl. 166-301.000.
Crawford, Kevin L.: *See*—
Czech, Edward A.; Goodrich, Ronald W.; and Crawford, Kevin L., 5,180,275, Cl. 414-541.000.
Crawford, Wheeler C.: *See*—
Sanderson, John R.; Crawford, Wheeler C.; and McCoy, David R., 5,180,866, Cl. 585-12.000.
Cray Research, Inc.: *See*—
Stansbury, Randall R.; and Seitz, Michael R., 5,180,093, Cl. 228-1.100.
Crespi, Ann M.: *See*—
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Crisci, Luciana: *See*—
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Cropper, Dennis J.; O'Bryan, James E.; and Waits, Susan, to Cincinnati Milacron, Inc. Velocity profile for clamp lockover. 5,180,530, Cl. 264-40.500.
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Parikh, Harsh B.; and Crosby, Robert M., 5,181,231, Cl. 377-26.000.
Crosson, Penny S. Insulated nursing bottle/toy. 5,180,071, Cl. 215-11.100.
Crownover, Joseph W.: *See*—
Monsees, John C.; Crownover, Joseph W.; and Burer, Aubrey M., 5,179,773, Cl. 29-25.420.
Crumly, William R.: *See*—
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CSA, Inc.: *See*—
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Cummins Power Generation, Inc.: *See*—
Rosswurm, Mark A., 5,180,939, Cl. 310-27.000.
Cunkle, Glen T.; Ravichandran, Ramanathan; and Sabrsula, Donald J., to Ciba-Geigy Corporation. Substituted 1-hydroxy-2,6-diaryl-4-acyloxypiperidines or 1-hydroxy-2,6-diaryl-4-acylaminopiperidines and stabilized compositions. 5,180,829, Cl. 546-188.000.
Cunningham, Sinclair: *See*—
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Curtis Manufacturing Company, Inc.: *See*—
Bakanowsky, Louis J., III, 5,179,808, Cl. 51-205.0WG.

Cusack, Timothy M.; Sickora, Vincent J.; and Bender, Robert W., to Sterling Winthrop, Inc. Antimicrobial composition. 5,180,749, Cl. 514-726.000.

Cyberonics, Inc.: *See*—
Stanislaw, Henry, 5,179,950, Cl. 128-423.00R.

Czech, Edward A.; Goodrich, Ronald W.; and Crawford, Kevin L., to Braun Corporation, The. Rotary bus lift with power stowable platform. 5,180,275, Cl. 414-541.000.

Czubatyj, Wolodymyr; Ovshinsky, Stanford R.; Wicker, Guy C.; Beglau, David; Himmler, Ronald; Jablonski, David; and Guha, Subhendu, to Energy Conversion Devices, Inc. Method of forming a layer of doped crystalline semiconductor alloy material. 5,180,690, Cl. 437-233.000.

D & S Manufacturing Co.: *See*—
Wisnasky, Donald, 5,179,762, Cl. 15-314.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Umise, Shigeki; and Imamura, Hirokatsu, 5,180,607, Cl. 427-8.000.

Daido Tokushuko Kabushiki Kaisha: *See*—
Tsukuta, Kenji; and Iikubo, Tomohito, 5,180,446, Cl. 148-422.000.

Dailliez, Olivier; and Mayet, Jean-Claude, to Sedepro. Pair of hooks for an apparatus for the manufacture of a tire reinforcement and apparatus comprising such pair of hooks. 5,180,462, Cl. 156-397.000.

Daimler-Benz AG: *See*—
Muller, Manfred; Henseler, Wolfgang; Katz, Egon; Bossenmaier, Alban; and Hamm, Dietrich, 5,180,187, Cl. 280-732.000.

Daimler-Benz Aktiengesellschaft: *See*—
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Dainippon Screen Mfg. Co., Ltd.: *See*—
Sugimoto, Kenji; and Fujita, Mitsuhiro, 5,180,431, Cl. 118-52.000.
Yamamoto, Toshio; and Sawada, Koji, 5,180,322, Cl. 445-37.000.

Daiso Co., Ltd.: *See*—
Takahashi, Takashi; and Takehira, Yoshikazu, 5,180,844, Cl. 556-436.000.

Dalibor, Horst, to Synthopol Chemie Dr. rer. pol. Koch GmbH & Co., KG. Copolymerizate solutions based on addition products of α,β-unsaturated carboxylic acids with glycidyl esters and of α,β-unsaturated monomers which can be copolymerized with them. 5,180,773, Cl. 524-853.000.

Dallas Semiconductor Corp.: *See*—
Harrington, Thomas E., III; and Lee, Robert D., 5,181,091, Cl. 257-355.000.

Dalrymple, John C.; and Bigger, Scott W., to Tektronix, Inc. Method and apparatus for representing three-dimensional color data in a one-dimensional reference system. 5,181,014, Cl. 340-703.000.

Dang, Vu A.: *See*—
Cookson, Gleason O.; Dang, Vu A.; and Raman, Krishna, 5,180,830, Cl. 546-222.000.

Dantlgraber, Jorg, to Mannesmann Rexroth GmbH. Hydraulic system for a differential piston type cylinder. 5,179,836, Cl. 60-430.000.

Darchy, Francois; and Zobel, Jean-Claude, to Rhone-Poulenc Agrochimie. Herbicidal compositions comprising N-phosphonomethylglycine and alkyl polyoxyethylene phosphoric acid ester surfactants. 5,180,414, Cl. 504-206.000.

Darnanville, Jean P.: *See*—
Moureaux, Patrick; and Darnanville, Jean P., 5,180,701, Cl. 502-64.000.

Dataproducts Corporation: *See*—
Mackay, Donald; Paul, Joseph; and Goble, Greg, 5,181,049, Cl. 316-140.00R.

Datascope Corporation: *See*—
Kontos, Stavros B.; and Urbanski, Jeffrey C., 5,180,367, Cl. 604-101.000.

Daum, Lothar: *See*—
Doerper, Thomas; Moeller, Achim; Hillen, Heinz; Keilhauer, Gerhard; Emling, Franz; and Daum, Lothar, 5,180,811, Cl. 530-351.000.

Dave, Paritosh R. 4,4-6,6-tetronitroadamantan-2-one. 5,180,853, Cl. 568-305.000.

Davidson, Howard L.; and Nishtala, Satyanarayana, to Sun Microsystems, Inc. Stacking heatpipe for three dimensional electronic packaging. 5,181,167, Cl. 361-385.000.

Davidson, James A. Zirconium oxide and nitride coated prosthesis for wear and corrosion resistance. 5,180,394, Cl. 623-18.000.

Davies, Haydn: *See*—
Marcuson, Samuel W.; Landolt, Carlos A.; Amson, James H.; and Davies, Haydn, 5,180,423, Cl. 75-649.000.

Davis, Albert D., to Monfort, Inc. Method and apparatus for removing a hide from a back portion and tail of a carcass. 5,180,328, Cl. 452-128.000.

Davis, Dennis W.; and Scalise, Stanley, to United Technologies Corporation. Fast acquisition optical frequency locked loop. 5,181,138, Cl. 359-239.000.

Davis, Gail F.: *See*—
Kersey, Joe B.; and Davis, Gail F., 5,180,190, Cl. 280-838.000.

Davis, John W.: *See*—
Asbury, Jimmie; and Davis, John W., 5,181,038, Cl. 342-70.000.

Davis, Stephen C.; and Evans, Sydney, to Kratos Analytical Limited. Mass spectrometry systems. 5,180,914, Cl. 250-287.000.

Davison, Kenneth E.: *See*—
Krummell, John V. R.; and Davison, Kenneth E., 5,180,069, Cl. 211-151.000.

Daw Technologies, Inc.: *See*—
Daw, Terry L.; Procter, David F.; and Moss, Kevin D., 5,180,331, Cl. 454-187.000.

Daw, Terry L.; Procter, David F.; and Moss, Kevin D., to Daw Technologies, Inc. Subfloor damper and spill container. 5,180,331, Cl. 454-187.000.

Dean, Peter E. Propeller assembly. 5,180,286, Cl. 416-220.00A.

Dean, Richard T., to Centocor. One vial method for labeling protein/-linker conjugates with technetium-99M. 5,180,816, Cl. 530-404.000.

de Angeli, Vicki. Adapter for receiving rectangular beverage containers. 5,180,088, Cl. 224-42.420.

De Bernardinis, Silvia: *See*—
Cabri, Walter; Candiani, Ilaria; De Bernardinis, Silvia; and Francalanci, Franco, 5,180,758, Cl. 552-201.000.

DeBernardis, John F.: *See*—
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DeBlasio, James A.: *See*—
Adams, John M.; Chance, Christopher N.; DeBlasio, James A.; Evers, Donald H.; Kirby, Michael A., Sr.; Newsome, Reginald W.; and Talley, Robert E., 5,180,056, Cl. 206-256.000.
Chance, Christopher N.; DeBlasio, James A.; Evers, Donald H.; Harris, William C., Jr.; Kirby, Michael A., Sr.; Newsome, Reginald W.; and Talley, Robert E., 5,180,055, Cl. 206-256.000.

DeCarlo, Donald J. Collapsible picnic cook-stove. 5,179,932, Cl. 126-9.00R.

Decorzani, Rene : *See*—
Naef, Ferdinand; Decorzani, Rene ; Naef, Regula; Blanc, Pierre-Alain; and van Beem, Nicole, 5,180,710, Cl. 512-26.000.

Dedo, Richard G. Cast padding. 5,180,359, Cl. 602-6.000.

Deichmann, Richard E., to United Technologies Corporation. Climatic heat aircraft protective screen. 5,179,968, Cl. 135-88.000.

Deisenhofer, Manfred: *See*—
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De Laforcade, Vincent, to L'Oreal. Roll-on application with frangible cap. 5,180,242, Cl. 401-132.000.

Delco Electronics Corporation: *See*—
Rada, Mark Z.; Willis, John W.; Eade, John A.; and Kidwell, Charles E., 5,180,050, Cl. 200-329.000.

Delepierre, Bertrand; and Coupleux, Louis. Apparatus for generating at least one jet of gaseous fluid. 5,180,330, Cl. 454-64.000.

DeLuca, Joan S.: *See*—
DeLuca, Michael J.; Erhart, Richard A.; and DeLuca, Joan S., 5,181,227, Cl. 375-95.000.

DeLuca, Michael J.; Erhart, Richard A.; and DeLuca, Joan S., to Motorola, Inc. Receiver having a signal detector and bit synchronizer. 5,181,227, Cl. 375-95.000.

DeMarco, Thomas M. Vacuum loader with vaned and short tangential separator. 5,180,407, Cl. 55-302.000.

Demma, Nick A.: *See*—
Postma, Stephen J.; Gesin, Milford M.; Demma, Nick A.; Bjork, Paul E.; and Wagener, Thomas J., 5,180,978, Cl. 324-207.160.

Demmering, Guenther: *See*—
Fleckenstein, Theo; Goebel, Gerd; Carduck, Franz-Josef; Demmering, Guenther; and Kubersky, Hans-Peter, 5,180,858, Cl. 568-885.000.

Demoute, Jean-Pierre: *See*—
Babin, Didier; Demoute, Jean-Pierre; and Tessier, Jean, 5,180,741, Cl. 514-531.000.

Demuth, Thomas P., Jr.: *See*—
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Denchfield, Clifford, to Loral Europe Limited. Gunfire simulator. 5,180,878, Cl. 89-7.000.

Dencks, Carl G.; and Roedel, Gunther, to Bodenseewerk Perkin-Elmer GmbH. Atomic absorption spectrometer. 5,181,077, Cl. 356-307.000.

Deneau, Myron E.: *See*—
Moore, Henry J., Jr.; Gidanian, Bijan; and Deneau, Myron E., 5,179,914, Cl. 122-17.000.

Denham, Thomas E.: *See*—
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Denki Kagaku Dogyo Kabushiki Kaisha: *See*—
Yamashita, Masami; Iwato, Noboru; Mine, Hideki; and Toshiaki, Wada, 5,181,151, Cl. 360-126.000.

Denner, Harry T.: *See*—
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Densel, David S.: *See*—
Boland, John D.; Fournier, Paul J.; Field, John C.; and Densel, David S., 5,179,976, Cl. 137-614.060.

Dent, Paul W., to Telefonaktiebolaget L M Ericsson. Method and arrangement for frequency synthesis. 5,180,993, Cl. 331-16.000.

Derfiny, Dennis, to Motorola, Inc. Wave-guide I/O for optical or electro-optical components. 5,181,263, Cl. 385-24.000.

Des Champs, Nicholas H. Heat recovery ventilating dehumidifier. 5,179,998, Cl. 165-1.000.

De Seroux, Nicolas; and Limouzin, Dominique, to Framatome. Handling flask comprising a device for displacement of a load along a vertical axis. 5,180,541, Cl. 376-271.000.

Designtech International, Inc.: *See*—
Gottlieb, Mark; and Roche, Tom, 5,181,019, Cl. 340-474.000.

Desmarais, Brett A.: *See*—
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Desor, Hans-Juergen: *See—*
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Deutsche Airbus GmbH: *See—*
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Deutsche Automobilgesellschaft mbH: *See—*
Berger, Gerhard; Benczur-Urmossy, Gabor; and von Benda, Klaus, 5,180,646, Cl. 429-198.000.
Deutsche Forschungsanstalt Fur Luft- Und Raumfahrt E.V.: *See—*
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Deutsche ITT Industries GmbH: *See—*
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DeVries, Jeffrey T.: *See—*
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DeWitt, Michael D.: *See—*
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Dewolf, Thomas L.: *See—*
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Dharia, Amitkumar N.: *See—*
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DiCarlo, Paul, to American Cyanamid Company. Bone pinning system. 5,180,388, Cl. 623-16.000.
Dicke, Paul A.: *See—*
Kouzel, Richard L.; Penn, Aubery W.; Jensen, Brian D.; and Dicke, Paul A., 5,180,003, Cl. 165-121.000.
Dickson, Lawrence J.; and Blake, Donald L. Method and means for producing disks of tightly packed on-end aligned fibers. 5,179,778, Cl. 29-876.000.
Dickson, Rennie L.; Godfrey, Craig W.; Schwendemann, Kenneth L.; and Noack, Timothy J., to Otis Engineering Corp. Valve with pressure assisted closing system. 5,179,973, Cl. 137-433.000.
DiCosimo, Robert: *See—*
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Didier-Weke AG: *See—*
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DiDio, Gary M.; Jones, Kermit; Hoffman, Kevin; Laarman, Timothy; Call, Jon; and Nath, Prem, to United Solar Systems Corporation. Interfacial plasma bars for photovoltaic deposition apparatus. 5,180,434, Cl. 118-718.000.
Dierenbach, Karl; Jacoby, Elliot G., Jr.; Snavely, Dan A.; Tucker, Darryl W.; Walck, Scott N.; and Walck, Scott N., to Lutron Electronics Co., Inc. Wallbox electric device assembly. 5,180,886, Cl. 174-66.000.
Dietrick, Gerald P.; and Vagedes, Michael J., to Venture Production Company. Filter screen assembly and method of filtering constituents from fluid mixtures. 5,180,488, Cl. 210-232.000.
DiGiovanni, David J.: *See—*
Chung, Yun C.; DiGiovanni, David J.; Stone, Julian; Sulhoff, James W.; and Zyskind, John L., 5,181,210, Cl. 372-6.000.
Di Ianni, Ludmilla P.; and Carver, Edward L., Jr., to Fisher Scientific Company. Lysing reagent for leukocyte differentiation method. 5,180,677, Cl. 436-17.000.
Dillner, Joakim; Lerner, Richard A.; Smith, Richard; and Parks, D. Elliot, to Scripps Research Institute, The. Polypeptides and compositions of human papillomavirus latent proteins, diagnostic systems and methods. 5,180,806, Cl. 530-326.000.
Dipple, Stephen G.: *See—*
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DiRe, John, to IMO Industries Inc. Hydraulic pump with foamed elastomeric member in outlet chamber to reduce liquid-borne noise. 5,180,298, Cl. 418-181.000.
DNA Plant Technology Corporation: *See—*
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Doehner, Robert F., Jr.: *See—*
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Doerper, Thomas; Moeller, Achim; Hillen, Heinz; Keilhauer, Gerhard; Emling, Franz; and Daum, Lothar, to BASF Aktiengesellschaft. Proteins having a TNF action comprising TNF-fibromectin fusion protein. 5,180,811, Cl. 530-351.000.
Dole, Douglas R.: *See—*
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Doll, Joseph E.: *See—*
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Domas, Friedrich: *See—*
Haardt, Udo; Seiler, Erhard; Tatzel, Hermann; Schwager, Harald; and Domas, Friedrich, 5,180,628, Cl. 428-215.000.
Donath, Steven M., to Southwire Company. Apparatus for cleaning stranded cable. 5,179,830, Cl. 57-305.000.
Donn, Anthony; and Koester, Charles J. Intraocular-external lens combination system and method of using same. 5,180,389, Cl. 623-6.000.
Donner, Andreas: *See—*
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Donovan, T. L.; and Allemandi, R. J., to Sutter Corporation. Passive anatomic shoulder exerciser. 5,179,939, Cl. 128-25.00R.
Doolittle, Mike. Drill chuck key. 5,180,175, Cl. 279-147.000.
Dopatka, Hans-Detlef, to Behringwerke Aktiengesellschaft. Washing solution, which contains a complexing agent for metal ions, for a solid-phase immunometric method, and the use thereof. 5,180,664, Cl. 435-7.920.
Dorai, Suriyanarayan, to Du Pont de Nemours, E. I., and Company. Reduction of molecular weight of poly(tetramethylene ether) glycol. 5,180,857, Cl. 568-617.000.
Dorn, Bryan B. Skateboard security device. 5,179,847, Cl. 70-18.000.
Dorricott, Martin R.: *See—*
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Douglas, Jerry A.; and Pfitzinger, Walter R., to 7L Corporation. Bottle cap with dental floss dispenser. 5,180,090, Cl. 225-42.000.
Dow Chemical Company, The: *See—*
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Dow Corning Corporation: *See—*
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Dowden, Douglas C.; Hemmeter, Richard W.; Herr, Diane E.; McCormick, William K.; Petrelli, Robert; Piereth, Richard J.; Salchenberger, Samuel M.; Sehgal, Chander S.; and Verma, Mahendra K., to AT&T Bell Laboratories. Automation of telephone operator assistance calls. 5,181,237, Cl. 379-88.000.
DowElanco: *See—*
Tai, Eva F.; Hull, John W., Jr.; and First, Kenneth E., 5,180,700, Cl. 502-50.000.
Turner, James A., 5,180,417, Cl. 504-246.000.
Dowell Schlumberger Incorporated: *See—*
McConnell, Stanley B., 5,180,500, Cl. 210-721.000.
Dower, Steven K.; March, Carl J.; Sims, John E.; and Urdal, David L. Soluble human interleukin-1 receptors, compositions and method of use. 5,180,812, Cl. 530-351.000.
Down, William J.; and Hayward, Robert D., to Gilbert Engineering Company, Inc. Tamper-resistant cable terminator system. 5,179,877, Cl. 81-443.000.
Doya, Hideki: *See—*
Oshibe, Yoshihiro; Izumi, Toshihiro; Doya, Hideki; Ohmura, Hiroshi; Yamamoto, Yasuhiro; and Kumazawa, Keiji, 5,180,760, Cl. 523-169.000.
Drake, Gerald E.; Gray, Thomas R.; and Izen, Paul G., to Minnesota Mining and Manufacturing Company. Electrode with pre-wired leads. 5,180,379, Cl. 606-32.000.
Drechsel, Dieter; and Jericho, Karl, to Leybold Aktiengesellschaft. Apparatus for pulling monocrystals. 5,180,562, Cl. 422-429.000.
Drews, Robert C. Intraocular lens with reinforcing element. 5,180,390, Cl. 623-6.000.
Drillien, Robert; and Spehner, Daniele, to Transgene, S. A. Recombinant fowlpox virus. 5,180,675, Cl. 435-235.100.
Driscoll, Daniel F.; and Cooper, Dennis B. Water flow patch. 5,180,270, Cl. 411-369.000.
Druez, Catherine; Coulie, Pierre; Uyttenhove, Catherine; and Van Snick, Jacques, to Ludwig Institute for Cancer Research. Uses of substantially pure interleukin-9 receptor. 5,180,678, Cl. 436-501.000.
Drulias, Dean J.; and Barry, Kevin P. Lumbar support therapeutic heat/cooling/air pillow belt. 5,179,942, Cl. 128-101.100.
Drzewiecki, Tadeusz M.: *See—*
Jarocki, George J.; and Drzewiecki, Tadeusz M., 5,179,970, Cl. 137-9.000.
DSC Communications Corporation: *See—*
Martin, Edward G., 5,180,312, Cl. 439-78.000.
D'Souza, Godfrey P.: *See—*
Laird, Douglas; and D'Souza, Godfrey P., 5,180,937, Cl. 307-602.000.
Du Pont Canada, Inc.: *See—*
White, George, 5,180,458, Cl. 156-87.000.
Du Pont Merck Pharmaceutical Company: *See—*
Cook, Leonard, 5,180,729, Cl. 514-317.000.
Duarte, Francisco J., to Eastman Kodak Company. Laser oscillator. 5,181,222, Cl. 372-53.000.
Dubief, Claude: *See—*
Sebag, Claude; and Dubief, Claude, 5,180,584, Cl. 424-401.000.
Duckeck, Ralf, to Robert Bosch GmbH. Computation-conserving traffic data transmission method and apparatus. 5,181,208, Cl. 371-40.100.
Dunaway, Kenneth W.: *See—*
Brown, Robert L.; Codispoti, Thomas E.; and Dunaway, Kenneth W., 5,179,806, Cl. 51-165.710.
Du Pont de Nemours, E. I., and Company: *See—*
Anton, David L.; DiCosimo, Robert; and Porta, Earnest W., 5,180,846, Cl. 562-17.000.
Dorai, Suriyanarayan, 5,180,857, Cl. 568-617.000.
Fernandez, Richard E.; and Kaplan, Ralph B., 5,180,860, Cl. 570-157.000.
Higley, David P., 5,180,845, Cl. 556-445.000.
Jacobson, Howard W.; Scholla, Michael H.; and Samuels, Sam L., 5,180,585, Cl. 424-405.000.
Mason, Eileen, 5,180,651, Cl. 430-138.000.

Matrick, Howard; Shepard, Michele E.; and You, Young S., 5,180,425, Cl. 106-22.00R.
Moore, Earl P., 5,180,587, Cl. 424-408.000.
Paciello, Rocco A., 5,180,870, Cl. 585-277.000.
Rigby, Stephen D.; and Styan, Paul A., 5,180,654, Cl. 430-309.000.
Stein, Hans, 5,180,115, Cl. 242-56.900.
Tinsley, Otis B.; and Yngve, Paul W., 5,179,827, Cl. 57-204.000.

Durand, David, to Key-Tech, Inc. Shielded plastic enclosure to house electronic equipment. 5,180,513, Cl. 252-62.550.

Durand, David; Vieau, David P.; Chu, Ang-Ling; and Weiu, Tai S., to Poly-Flex Circuits, Inc. Electrically conductive cement containing agglomerate, flake and powder metal fillers. 5,180,523, Cl. 252-512.000.

Durr, Rene C., to U.S. Philips Corp. Plasma generator. 5,180,949, Cl. 315-111.510.

Dutcher, Robert G.; Packard, Brian M.; and Scott, Robert J., to Possis Medical, Inc. Cardiac lead with retractible fixators. 5,179,962, Cl. 128-785.000.

Dworsky, Lawrence N.; Jaskie, James E.; and Kane, Robert C., to Motorola, Inc. Electron device electron source including a polycrystalline diamond. 5,180,951, Cl. 315-169.300.

Dysarz, Edward D. Self destructive safety syringe. 5,180,369, Cl. 604-110.000.

E. J. Brooks: *See*—
Georgopoulos, George; and Gnoinski, Richard, 5,180,200, Cl. 292-326.000.

E. R. Squibb & Sons, Inc.: *See*—
Joshi, Yatindra M.; Chiesa, Pierina; and Jain, Nemichand B., 5,180,589, Cl. 424-465.000.

Eade, John A.: *See*—
Rada, Mark Z.; Willis, John W.; Eade, John A.; and Kidwell, Charles E., 5,180,050, Cl. 200-329.000.

Eastman Kodak Company: *See*—
Bagrodia, Shriram; Fagerburg, David R.; Gedon, Steven; Watkins, Joseph J.; Lawrence, Paul B.; and Rule, Mark, 5,180,775, Cl. 525-64.000.
Close, Richard C.; Gregory, H. Scott, Jr.; and Walker, Douglas G., 5,181,124, Cl. 358-300.000.
Duarte, Francisco J., 5,181,222, Cl. 372-53.000.
Kuo, Yeong-Jen; and Bellas, Michael, 5,180,842, Cl. 552-293.000.
Lee, J. Kelly; Reznik, Svetlana; and Regelsberger, Matthias H., 5,181,021, Cl. 340-572.000.
Rubin, Bruce J., 5,181,075, Cl. 355-259.000.
Smith, Robert M.; Ting, David M. T.; Boer, Jan H.; and Mendelssohn, Marvin, 5,181,162, Cl. 364-419.000.

Eaton Corporation: *See*—
Casey, Todd A.; and Jackson, Alan D., 5,179,835, Cl. 60-386.000.
Christopher, Gary L., 5,180,959, Cl. 318-626.000.
Hicks, Bradford W.; Blust, Brian R.; Beverly, James A.; and Schultz, Gary R., 5,179,981, Cl. 141-4.000.
Reynolds, Joseph D.; and Stine, Alan C., 5,179,866, Cl. 74-332.000.
Reynolds, Joseph D., 5,179,869, Cl. 74-473.00R.
Schultz, Gary R.; and Ruzicka, Lawrence M., 5,180,456, Cl. 152-416.000.

Ebara Corporation: *See*—
Kimura, Yoshikazu; and Teuboi, Hideo, 5,180,173, Cl. 277-96.100.

Eckenhoff, James B.: *See*—
Magruder, Judy A.; Peery, John R.; and Eckenhoff, James B., 5,180,591, Cl. 424-473.000.

Eckert, Horst, to WABCO Westinghouse Fahrzeugbremsen GmbH. Device for obtaining an axle-load signal of a mechanically spring-supported drive axle of a lifting axle structure. 5,180,185, Cl. 280-704.000.

Eddins, Fred D.; and Patterson, Maureen, to Hasbro, Inc. Poseable hair strand for toy doll. 5,180,325, Cl. 446-385.000.

Edds, Thomas A.: *See*—
Cook, Robert G.; Runyan, Daniel J.; Rezac, Willard J.; Edds, Thomas A.; and Bilas, Ronald J., 5,180,051, Cl. 200-400.000.

Eden, Benjamin, to State of Israel - Ministry of Defence Armament Development Authority. Optical imaging system made from a single piece of material. 5,181,145, Cl. 359-859.000.

Edenbaum, Martin; Frisch, Kurt C.; Sendijarevic, Aisa; and Wong, Shaio-wen, to Carapace. Orthopedic casting material having reduced tack and reduced slip. 5,180,632, Cl. 428-253.000.

Edwards, John J.; and Lohr, Billy J. Night fishing light. 5,179,797, Cl. 43-17.500.

Edwards, Richard C., to Rockwell International Corporation. Filter system with controlled amplitude in stopband or passband. 5,180,999, Cl. 333-175.000.

Efferson, Chip: *See*—
Abboud, Harry I.; and Efferson, Chip, 5,179,903, Cl. 110-345.000.

Egawa, Akira, to Canon Kabushiki Kaisha. Camera having magnetic head for demagnetizing and recording in demagnetization pattern. 5,181,058, Cl. 354-105.000.

Egnor, Michael E., to United States of America, Navy. Automated answer evaluation and scoring system and method. 5,180,309, Cl. 434-323.000.

Ehrenfried, Ted H., to Alpine Life Sports. Simulated stair climbing exercise apparatus having variable sensory feedback. 5,180,351, Cl. 482-52.000.

Eich, Eckart: *See*—
Muller, Werner E. G.; Zahn, Rudolf K.; and Eich, Eckart, 5,180,748, Cl. 514-691.000.

Eidenschink, Rudolf; Hopf, Reinhard; and Poetsch, Eike, to Merck Patent Gesellschaft mit beschraenkter Haftung. Chiral compounds. 5,180,521, Cl. 252-299.610.

Eihusen, John A.; and Jared, Roy A., to Baldwin Filters, Inc. Lubricant filter assembly with internal bypass lock-out. 5,180,490, Cl. 210-239.000.

Eimori, Takahisa; Wakamiya, Wataru; Ozaki, Hiroji; Tanaka, Yoshinori; and Satoh, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Complementary semiconductor device having improved device isolating region. 5,181,094, Cl. 257-372.000.

Eimori, Takahisa: *See*—
Wakamiya, Wataru; Tanaka, Yoshinori; Eimori, Takahisa; Ozaki, Hiroji; Kimura, Hiroshi; and Satoh, Shinichi, 5,180,683, Cl. 437-47.000.

Electronics & Space Corp.: *See*—
Wootton, John R.; and Waldman, Gary, 5,180,881, Cl. 89-41.190.

Electrovac Fabrikation Elektrotechnischer: *See*—
Bayer, Helmut, 5,181,005, Cl. 337-354.000.

Eley, John H. Hose reel. 5,179,972, Cl. 137-355.190.

Elf Atochem Italia S.r.l.: *See*—
Sempio, Carlo; Anghileri, Andrea; Binaghi, Marc; Ronchetti, Tullo; and Vailati, Italo, 5,180,634, Cl. 428-336.000.

Elias, Eric. Integration system for solar modules. 5,180,442, Cl. 136-251.000.

Elliott, Douglas C.: *See*—
Baker, Eddie G.; and Elliott, Douglas C., 5,180,868, Cl. 585-240.000.

Ellman, Alan G.: *See*—
Garito, Jon C.; and Ellman, Alan G., 5,180,308, Cl. 434-262.000.

Elmore, Michael S.: *See*—
Peterson, William A.; Elmore, Michael S.; and Sherwood, Steven D., 5,181,159, Cl. 363-89.000.

El-Sharkawi, Mohamed A.; Andexler, George; and Silberkleit, Lee I., to University of Washington, Board of Regents of the. Optically triggered high voltage switch network and method for switching a high voltage. 5,180,963, Cl. 323-211.000.

Elvin-Jensen, Flemming. Container. 5,180,064, Cl. 206-598.000.

Emhart Glass Machinery Investments Inc.: *See*—
Pinkerton, Steven J.; and Menard, Alan, 5,180,413, Cl. 65-334.000.

Emhart, Inc.: *See*—
Farwell, Robert M., 5,180,264, Cl. 411-32.000.

Emling, Franz: *See*—
Doerper, Thomas; Moeller, Achim; Hillen, Heinz; Keilhauer, Gerhard; Emling, Franz; and Daum, Lothar, 5,180,811, Cl. 530-351.000.

Endo, Suehiro: *See*—
Ueta, Koki; Kamada, Naoki; Mori, Hideo; Endo, Suehiro; and Tajima, Susumu, 5,179,864, Cl. 74-7.00A.

Endoh, Masami: *See*—
Tsurutani, Kazushi; Hosogai, Daijiro; Kokubo, Kakuro; Kobayashi, Taiji; Higashimoto, Noboru; Endoh, Masami; Namiyama, Kazuyoshi; and Yoneda, Makoto, 5,179,923, Cl. 123-435.000.

Energy Conversion Devices, Inc.: *See*—
Baneriee, Arindam; and Guha, Subhendu, 5,180,686, Cl. 437-181.000.
Czubatyj, Wolodymyr; Ovshinsky, Stanford R.; Wicker, Guy C.; Beglau, David; Himmler, Ronald; Jablonski, David; and Guha, Subhendu, 5,180,690, Cl. 437-233.000.

Engvall, Eva: *See*—
Ruoslahti, Erkki I.; Engvall, Eva; and Gehlsen, Kurt R., 5,180,809, Cl. 530-350.000.

Enichem Synthesis S.p.A.: *See*—
Casilli, Nicola; Crisci, Luciana; Renzi, Fiorenzo; and Rivetti, Franco, 5,180,524, Cl. 252-586.000.

Ensminger, William D.; Knol, James A.; and Andrews, James C. Implantable infusion device. 5,180,365, Cl. 604-93.000.

Envirozone Technologies, Inc.: *See*—
Hinson, Charles; and LaCrosse, Gaylen, 5,180,499, Cl. 210-706.000.

Epple, Anton; Trube, Hans; and Pfeiffer, Martin, to Daimler-Benz Aktiengesellschaft. Drive mechanism with lost motion play for a windshield wiper device of motor vehicles. 5,179,759, Cl. 15-250.130.

Epple, Gerhard, to BASF Aktiengesellschaft. Preparation of 1-amino-2-chloro-4-hydroxyanthraquinone. 5,180,841, Cl. 522-244.000.

Equipments Speciaux Pour l'Aviation (ESPA): *See*—
Pascor, Michel, 5,180,124, Cl. 248-74.400.

Era, Susumu; Matsumoto, Toshio; Kobayashi, Yoshinori; Shitara, Masashi; Hattori, Isamu; and Nomura, Yoshihiro, to Hitachi Chemical Company, Ltd. Impact modifier, thermoplastic resin composition using the same and molded article obtained therefrom. 5,180,786, Cl. 525-281.000.

Erhart, Richard A.: *See*—
DeLuca, Michael J.; Erhart, Richard A.; and DeLuca, Joan S., 5,181,227, Cl. 375-95.000.

Erickson, William R.; and Bouffard, Leif E., to Phosphate Engineering and Construction Company. Process for the production of phosphoric acid and hydrogen fluoride from phosphate rock and fluosilicic acid. 5,180,569, Cl. 423-319.000.

Erwin Sick GmbH Optik-Elektronik: *See*—
Hug, Gottfried, 5,180,922, Cl. 250-561.000.

Esaki, Takafumi, to NEC Corporation. Composite video signal generator. 5,181,099, Cl. 358-21.00R.

Escabasse, Jean-Yves, to Arjomari Europe. Supple sheet, resistant to tearing and bursting, with poor liquid-absorbing power and controlled porosity. 5,180,614, Cl. 428-34.200.

Eshtein, Itzhak: *See*—
Reuveni, Zohar; and Eshtein, Itzhak, 5,179,890, Cl. 99-362.000.

Establissements les Fils D'Auguste Comarat & Cie: *See*—
Fourezon, Andre , 5,180,633, Cl. 428-300.000.

ETA SA Fabriques d'Ebauches: *See*—
Paratte, Daniel; and Aeschbacher, Jean-Pascal, 5,181,192, Cl. 368-282.000.
ETEC Systems, Inc.: *See*—
McCarthy, Donald J., deceased; and Pastor, Manuel, 5,180,230, Cl. 384-54.000.
Ethicon, Inc.: *See*—
Cascio, Jack; Ivanov, Konstantin; Alpern, Marvin; Cerwin, Robert; and Siernos, Joseph, 5,180,053, Cl. 206-63.300.
Kalinski, Robert J.; Cerwin, Robert J.; and Alpern, Marvin, 5,179,818, Cl. 53-430.000.
Ethyl Petroleum Additives, Inc.: *See*—
Zaweski, Edward F.; and Culley, Scott A., 5,180,510, Cl. 252-47.000.
Eto, Yoshiyuki, to Nissan Motor Co., Ltd. Vehicle height control apparatus. 5,180,024, Cl. 180-41.000.
Etzweiler, Franz; Heimlinger, Daniel; Nussbaumer, Cornelius; and Pesaro, Mario, to Givaudan-Roure Corporation. Acetyl-tri-and-tetramethyl-octahydronaphthalenes and fragrance compositions containing same. 5,180,709, Cl. 512-17.000.
Evanite Fiber Corporation: *See*—
Rowland, Bob G.; Monigold, George E., Jr.; Brendle, Robert L.; and Rosse, Francis V., 5,180,647, Cl. 429-252.000.
Evans, Anthony C., to Kelsey-Hayes Company. Drum-in-hat parking brake for a disc brake assembly. 5,180,037, Cl. 188-70.00R.
Evans, Sydney: *See*—
Davis, Stephen C.; and Evans, Sydney, 5,180,914, Cl. 250-287.000.
Evensen, David P.: *See*—
Gename, John L.; and Evensen, David P., 5,179,810, Cl. 52-240.000.
Everett/Charles Contact Products, Inc.: *See*—
Van Loan, David R.; Johnston, Charles J.; and Swart, Mark A., 5,180,976, Cl. 324-158.00F.
Evers, Donald H.: *See*—
Adams, John M.; Chance, Christopher N.; DeBlasio, James A.; Evers, Donald H.; Kirby, Michael A., Sr.; Newsome, Reginald W.; and Talley, Robert E., 5,180,056, Cl. 206-256.000.
Chance, Christopher N.; DeBlasio, James A.; Evers, Donald H.; Harris, William C., Jr.; Kirby, Michael A., Sr.; Newsome, Reginald W.; and Talley, Robert E., 5,180,055, Cl. 206-256.000.
EVT Energie- und Verfahrenstechnik GmbH: *See*—
Gehrke, Bodo, 5,180,113, Cl. 241-79.100.
Ewing, Gerald D. Zero-voltage switched FM-PWM converter. 5,180,964, Cl. 323-222.000.
Exxon Chemical Patents Inc.: *See*—
Austin, Richard G.; and Patton, Tad L., 5,180,797, Cl. 525-539.000.
Exxon Research and Engineering Company: *See*—
Sartori, Guido; Ho, W. S. Winston; and Noone, Robert E., 5,180,496, Cl. 210-654.000.
Eyssa, Yehia M.: *See*—
Huang, Xianrui; and Eyssa, Yehia M., 5,181,170, Cl. 363-21.000.
Fagerburg, David R.: *See*—
Bagrodia, Shriram; Fagerburg, David R.; Gedon, Steven; Watkins, Joseph J.; Lawrence, Paul B.; and Rule, Mark, 5,180,775, Cl. 525-64.000.
Fagerlund, Allen C.: *See*—
Gethmann, Douglas P.; and Fagerlund, Allen C., 5,180,139, Cl. 251-127.000.
Fang, San-Chin; Melville, Robert C.; and Trajkovic, Ljiljana, to AT&T Bell Laboratories. Artificial parameter homotopy methods for the dc operating point problem. 5,181,179, Cl. 364-488.000.
Fanton, Jeffrey T.; Opsal, Jon; and Rosencwaig, Allan, to Therma-Wave, Inc. Method and apparatus for evaluating the thickness of thin films. 5,181,080, Cl. 356-381.000.
Fanuc Ltd.: *See*—
Matsuura, Hitoshi; and Aramaki, Hitoshi, 5,180,957, Cl. 318-578.000.
Sasaki, Takao; Fujibayashi, Kentaro; and Miyake, Masahiko, 5,181,178, Cl. 364-474.110.
Far Great Plastics Industrial Co., Ltd.: *See*—
Chen, Ting-Hsing, 5,180,176, Cl. 280-11.280.
Farden, David O. Cylindrical bale transport device. 5,180,271, Cl. 414-24.500.
Farmitalia Carlo Erba S.r.l.: *See*—
Cabri, Walter; Candiani, Ilaria; De Bernardinis, Silvia; and Francalanci, Franco, 5,180,758, Cl. 552-201.000.
Farnworth, Warren M.: *See*—
Mitchell, Steven L.; and Farnworth, Warren M., 5,180,974, Cl. 324-158.00F.
Farr, Glyn P. R., to Lucas Industries Public Limited Company. Dual brake pressure reducing valve assembly using single inertia responsive member. 5,180,212, Cl. 303-9.680.
Farr, James P.; and Carty, Daniel T., to Clorox Company, The. Stabilizing system for liquid hydrogen peroxide compositions. 5,180,514, Cl. 252-99.000.
Farrah, Ronald P. Process color separation guide for color transparencies. 5,180,305, Cl. 434-102.000.
Farrel Corporation: *See*—
Piccolo, Joseph R., Sr.; Swilling, William H., Jr.; Kearney, Michael R.; and Mosher, Douglas E., 5,180,225, Cl. 366-147.000.
Farwell, Robert M., to Emhart, Inc. Anchor bolt. 5,180,264, Cl. 411-32.000.
Farwell, William D., to Hughes Aircraft Company. Built-in test circuitry providing simple and accurate AC test of digital microcircuits with low bandwidth test equipment and probe stations. 5,181,191, Cl. 368-113.000.
Fatehi, Mohammad T.; and Srinivasan, Nattu V., to AT&T Bell Laboratories. Photonic cross-connect switch. 5,181,134, Cl. 359-117.000.
Faulkner, Michael T.: *See*—
Fay, John E.; and Faulkner, Michael T., 5,180,073, Cl. 215-261.000.
Favre, Bernard, to Lir France. Apparatus for dispensing cosmetics. 5,180,084, Cl. 222-192.000.
Fay, John E.; and Faulkner, Michael T., to Biomedical Polymers, Inc. Permeable cap for flask. 5,180,073, Cl. 215-261.000.
Feibus, Miriam H. Woven Surgical drain and woven surgical sponge. 5,180,375, Cl. 604-264.000.
Feider, Thomas H., to Shuttelift, Inc. Directional control system for a gantry type crane. 5,180,070, Cl. 212-218.000.
Feldmeier, Daniel R.; and McCann, Michael, to Oscar Mayer Foods Corporation. Peelable adhesive-based package seal and method of making same. 5,180,599, Cl. 426-106.000.
Felix, Clifford J. Golf swing practice net. 5,180,167, Cl. 273-181.00F.
Fellingham, George H.: *See*—
Bibl, Andreas; and Fellingham, George H., 5,181,050, Cl. 346-155.000.
Fennel, Helmut: *See*—
Weise, Lutz; Fennel, Helmut; and Wupper, Hans, 5,180,211, Cl. 303-9.630.
Ferguson, Dennis D.; and Havey, Gary D., to United States of America, Air Force. Conformal telemetry system. 5,181,025, Cl. 340-870.210.
Ferguson, John H., Sr.; and Heiss, James D., to Ferguson, John H., Sr. Vision system for bobbin stripping. 5,179,769, Cl. 28-292.000.
Fernandez, Richard E.; and Kaplan, Ralph B., to Du Pont de Nemours, E. I., and Company. Dehydrohalogenation process. 5,180,860, Cl. 570-157.000.
Ferraris, Chiara F.: *See*—
Gartner, Ellis M.; and Ferraris, Chiara F., 5,180,430, Cl. 106-730.000.
Ferro, Nicolo , to Alprogetti S.r.l. Self-locking coupling structure for connecting accessories to profiled elements. 5,180,250, Cl. 403-252.000.
Ferrous Wheel Group Inc.: *See*—
Rao, Banagaru V. N., 5,180,450, Cl. 148-579.000.
Feuling Engineering, Inc.: *See*—
Feuling, James J., 5,180,299, Cl. 418-190.000.
Feuling, James J., to Feuling Engineering, Inc. Roots type supercharger. 5,180,299, Cl. 418-190.000.
Few, Jeffrey P., to Norco Industries, Inc. Spring loaded jack stand. 5,180,131, Cl. 248-352.000.
Fibertek, Inc.: *See*—
Burnham, Ralph L.; Kasinski, Jeffrey J.; and Marshall, Larry R., 5,181,211, Cl. 372-21.000.
Fichtel & Sachs AG: *See*—
Axthammer, Ludwig; and Wossner, Felix, 5,180,039, Cl. 188-299.000.
Field, John C.: *See*—
Boland, John D.; Fournier, Paul J.; Field, John C.; and Densel, David S., 5,179,976, Cl. 137-614.060.
Figliuzzi, Vincent. Integrated engine and compressor device. 5,179,921, Cl. 123-198.00C.
Findlay Industries: *See*—
Coon, Gerald A.; Reinhart, Douglas A.; and Ray, Lawrence D., 5,180,460, Cl. 156-93.000.
Finduck S.r.L.: *See*—
Mannato, Pietro, 5,179,987, Cl. 150-118.000.
Finke, Harry P.: *See*—
Hovis, James E.; and Finke, Harry P., 5,180,300, Cl. 431-115.000.
Finkl, Charles W.; and Cerwin, Nicholas, to A. Finkl & Sons Co. Method for controlled fluid quenching of steel. 5,180,444, Cl. 148-660.000.
Finnigan Mat GmbH: *See*—
Laue, Hans-Jorg, 5,180,913, Cl. 250-281.000.
Firmenich S.A.: *See*—
Naef, Ferdinand; Decorzani, Rene ; Naef, Regula; Blanc, Pierre-Alain; and van Beem, Nicole, 5,180,710, Cl. 512-26.000.
First, Kenneth E.: *See*—
Tai, Eva F.; Hull, John W., Jr.; and First, Kenneth E., 5,180,700, Cl. 502-50.000.
Fischell, Robert E., to Cathco, Inc. Non-buckling thin-walled sheath for the percutaneous insertion of intraluminal catheters. 5,180,376, Cl. 604-282.000.
Fischer, Edward M., to Minnesota Mining and Manufacturing Company. Hot-gas-filtering fabric of spaced uncrimped support strands and crimped lofty fill yarns. 5,180,409, Cl. 55-486.000.
Fishburne, Howard H.: *See*—
Barnes, John D.; Fishburne, Howard H.; Pham, Xuan M.; and Pitt, Linwood L., Jr., 5,179,817, Cl. 53-148.000.
Fisher Controls International, Inc.: *See*—
Gethmann, Douglas P.; and Fagerlund, Allen C., 5,180,139, Cl. 251-127.000.
Fisher, Jay L.: *See*—
Kwun, Hegeon; Burkhardt, Gary L.; and Fisher, Jay L., 5,180,969, Cl. 324-71.200.
Fisher Scientific Company: *See*—
Di Ianni, Ludmilla P.; and Carver, Edward L., Jr., 5,180,677, Cl. 436-17.000.
Fishler, Theodor M.: *See*—
Shorr, Leonard M.; Fishler, Theodor M.; Yanay, Shaul; and Rumack, Michael, 5,180,787, Cl. 525-282.000.

Fishman, Henry; Olshaker, Robert; and Johnson, Gary, to Fishman, Henry. Allergy testing apparatus and method. 5,179,959, Cl. 128-743.000.
Fiskars OY AB: *See*—
Melter, Craig H., 5,179,783, Cl. 30-262.000.
Fitzgerald, John A.: *See*—
Aldridge, Tod; Fitzgerald, John A.; McGregor, Allan K.; Quates, Ronald D.; Schoen, Rudolf R.; Thangarasu, Appavoo; and Vicic, John C., 5,180,008, Cl. 166-84.000.
Flaherty, Matthew J.: *See*—
Flaherty, William J.; and Flaherty, Matthew J., 5,179,753, Cl. 15-104.120.
Flaherty, William J.; and Flaherty, Matthew J. Jet thruster with spinner head. 5,179,753, Cl. 15-104.120.
Flamm, Peter; Winterer, Martin; and Desor, Hans-Juergen, to Deutsche ITT Industries GmbH. Digital phase-locked loop. 5,181,115, Cl. 358-158.000.
Fleckenstein, Theo; Goebel, Gerd; Carduck, Franz-Josef; Demmering, Guenther; and Kubersky, Hans-Peter, to Henkel Kommanditgesellschaft auf Aktien. Process for the catalytic hydrogenation of liquid fatty acid methyl esters. 5,180,858, Cl. 568-885.000.
Flexible Products Company: *See*—
Cherfane, Raymond, 5,180,082, Cl. 222-145.000.
Florida Institute of Technology, Inc., The: *See*—
Grossman, Barry G.; and Caimi, Frank M., 5,180,911, Cl. 250-227.210.
Florida State University: *See*—
Rink, William J.; Schlenoff, Joseph B.; and Mathias, Haim H. G., 5,181,233, Cl. 378-79.000.
Flourlock (UK) Limited: *See*—
Hill, Guy C., 5,179,812, Cl. 52-589.000.
Flowers, F. W., Jr. Cargo tiedown anchor. 5,180,263, Cl. 410-106.000.
FMC Corporation: *See*—
Aldridge, Tod; Fitzgerald, John A.; McGregor, Allan K.; Quates, Ronald D.; Schoen, Rudolf R.; Thangarasu, Appavoo; and Vicic, John C., 5,180,008, Cl. 166-84.000.
Christian, Donald J.; Robertson, Graham D.; Tucci, James M.; and Westcott, Michael J., 5,180,122, Cl. 244-134.00F.
Walser, Robert A.; and Rydell, Earl E., 5,181,202, Cl. 370-85.150.
Foltz, Gilbert H., Jr.; and Harding, Stephen A., to Mr. Gasket Company. Wire loom mounting. 5,179,919, Cl. 123-143.00C.
Forbus, Thomas R., to Mobil Oil Corporation. Conversion of alpha-olefin dimer to liquid lubricant basestock. 5,180,863, Cl. 585-7.000.
Ford Motor Company: *See*—
Brown, Larry T., 5,179,875, Cl. 74-866.000.
Carriere, Donald L., 5,180,346, Cl. 475-200.000.
Ma, Thomas T., 5,180,559, Cl. 422-168.000.
Massie, Stephen P., 5,179,774, Cl. 29-451.000.
Ford New Holland, Inc.: *See*—
McLean, Kenneth W., 5,179,822, Cl. 56-6.000.
Forouhi, Abdul R., to Actel Corporation. Electrically programmable antifuse incorporating dielectric and amorphous silicon interlayer. 5,181,096, Cl. 257-530.000.
Forsheda AB: *See*—
Andersson, Joachim; and Gustafsson, Bengt-Goran, 5,180,147, Cl. 267-136.000.
Forti, Ernesto R.; and Jarvis, Judith A., to Jarvis Chemicals & Paper Company. Inflatable, encapsulating packaging insert. 5,180,060, Cl. 206-522.000.
Foseco International Limited: *See*—
Mulhorn, Fred M., 5,180,506, Cl. 249-197.000.
Neu, Max G.; and Gough, Michael J., 5,180,759, Cl. 523-141.000.
Foster, L. Dale; and Breidenbach, James H., to Hill-Rom Company, Inc. Hospital bed with inflatable and collapsible side edges and laterally-movable side guards. 5,179,744, Cl. 5-600.000.
Fourezon, Andre , to Establissements les Fils D'Auguste Comarat & Cie. Composite textile material capable of being employed for resin reinforcement. 5,180,633, Cl. 428-300.000.
Fournier, Paul J.: *See*—
Boland, John D.; Fournier, Paul J.; Field, John C.; and Densel, David S., 5,179,976, Cl. 137-614.060.
Fox, David A.: *See*—
Beg, Mirza A.; and Fox, David A., 5,181,155, Cl. 361-94.000.
Foxboro Company, The: *See*—
Jeannotte, Anthony C.; Gilby, Anthony C.; Cheney, M. Charles; and Meneghelli, Barry J., 5,181,082, Cl. 356-436.000.
Framatome: *See*—
De Seroux, Nicolas; and Limouzin, Dominique, 5,180,541, Cl. 376-271.000.
Grattier, Bernard, 5,180,545, Cl. 376-352.000.
Verdier, Michel, 5,180,548, Cl. 376-439.000.
Frame, Robert R.; Bricker, Jeffery C.; Stine, Laurence O.; and Verachtert, Thomas A., to UOP. Caustic free liquid/liquid process for sweeting a sour hydrocarbon fraction. 5,180,484, Cl. 208-189.000.
Francalanci, Franco: *See*—
Cabri, Walter; Candiani, Ilaria; De Bernardinis, Silvia; and Francalanci, Franco, 5,180,758, Cl. 552-201.000.
France, Timothy T.: *See*—
Ngo, Viet H.; Poole, Warren D.; Hancock, Sean J.; and France, Timothy T., 5,180,501, Cl. 210-747.000.
Francis, John: *See*—
Kump, Wilhelm; Borel, Christian; Chen, Jen; Veenstra, Siem J.; Francis, John; and Mugrage, Benjamin B., 5,180,718, Cl. 514-183.000.
Franklin, Dana, to Samsonite Corporation. Expandable garment bag and hanger bar therefor. 5,180,057, Cl. 206-279.000.
Franks, George J., Jr. Angled electrical connector. 5,180,317, Cl. 439-669.000.
Frantz, Brian H.; Jensen, Jack L.; and Miller, Gregory A., to General Motors Corporation. Inflation gas flow directing member for air bag system. 5,180,188, Cl. 280-740.000.
Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V.: *See*—
Richter, Axel; and Sandmeier, Herrmann, 5,180,288, Cl. 417-48.000.
Frazzini, Ronald M.; and Solosky, Rick M., to Honeywell Inc. Position measurement sensor using a linear variable differential transformer with a triangular pulse input and output. 5,180,979, Cl. 324-207.180.
Freeman, Leon D.: *See*—
Sawyer, Philip N.; and Freeman, Leon D., 5,180,839, Cl. 549-316.000.
Freeman, Richard F.: *See*—
Briggs, David H.; and Freeman, Richard F., 5,180,895, Cl. 219-10.55F.
Frenkil, Gerald L., to VLSI Technology, Inc. Testable power-on-reset circuit. 5,181,203, Cl. 371-15.100.
Frey, Alexander H., Jr.; Gould, Joel M.; and Higgins, Charles M., Jr., to International Business Machines Corporation. Adaptive routing in a parallel computing system. 5,181,017, Cl. 340-825.020.
Frey, Max; Livermore, Richard S.; and Bowie, John M., to McCain Foods Limited. System for producing helical vegetable strips and turbine therefor. 5,179,881, Cl. 83-98.000.
Freyne, Eddy J. E.; Raeymaekers, Alfons H. M.; Sipido, Victor; and Venet, Marc G., to Janssen Pharmaceutica N.V. (3-pyridinyl)methanone oxime derivatives. 5,180,832, Cl. 546-333.000.
Fried, Walter R.: *See*—
Lind, Harold V.; Fried, Walter R.; and Bricker, Jacob L., 5,181,041, Cl. 342-453.000.
Friedmann, Oswald: *See*—
Maucher, Paul; and Friedmann, Oswald, 5,180,335, Cl. 464-68.000.
Friese, Karl-Hermann; and Wiedenmann, Hans-Martin, to Robert Bosch GmbH. PTC temperature sensor for use in an exhaust gas system. 5,181,007, Cl. 338-22.00R.
Frigg, Robert; Perren, Stephan; Allgower, Martin; and Gisin, Paul, to Synthes (U.S.A.). Bone screw. 5,180,382, Cl. 606-65.000.
Frisch, Alan M.: *See*—
Morgan, Jerry L.; Frisch, Alan M.; and Hinrichs, Erhard W., 5,181,250, Cl. 381-51.000.
Frisch, Kurt C.: *See*—
Edenbaum, Martin; Frisch, Kurt C.; Sendijarevic, Aisa; and Wong, Shaio-wen, 5,180,632, Cl. 428-253.000.
Frost, John H. Hand accessory. 5,180,165, Cl. 273-165.000.
Fruh, Peter: *See*—
Henke, Jurgen; Spinner, Erwin; and Fruh, Peter, 5,179,927, Cl. 123-549.000.
Frye, Dale J.: *See*—
Suman, Michael J.; Reed, Stewart D.; Frye, Dale J.; and Clark, Russell L., 5,180,089, Cl. 224-42.45R.
Fuh, Giin-Fa; Morita, Nobuo; Whitfill, Donald L.; and Strah, David A., to Conoco Inc. Method for inhibiting the initiation and propagation of formation fractures while drilling. 5,180,020, Cl. 175-72.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Miyamoto, Yasuhiko, 5,180,108, Cl. 239-172.000.
Fuji Oil Co., Ltd.: *See*—
Yokoyama, Hitoshi; Sawamura, Norio; and Motobayashi, Noriko, 5,180,596, Cl. 426-36.000.
Fuji Photo Film Co., Ltd.: *See*—
Kimura, Kei, 5,181,118, Cl. 358-213.160.
Masuda, Nobuhito, 5,180,815, Cl. 530-404.000.
Matsui, Toshitaka; Torisawa, Nobuyuki; and Yazawa, Yoshiyuki, 5,180,156, Cl. 271-103.000.
Morikawa, Seiichiro, 5,181,068, Cl. 355-77.000.
Nakamura, Takashi, 5,180,648, Cl. 430-21.000.
Oda, Kazuya, 5,181,101, Cl. 358-41.000.
Ohgoda, Makoto, 5,180,915, Cl. 250-327.200.
Orimoto, Masaaki; Harase, Toshikatsu; and Mizuno, Masahiko, 5,179,871, Cl. 74-516.000.
Ozawa, Yoshio; Matsumoto, Takashi; and Saito, Kimitoshi, 5,181,066, Cl. 355-29.000.
Takagi, Junichi; and Hirasaki, Norio, 5,181,057, Cl. 354-94.000.
Yamaguchi, Jun; Ishige, Sadao; Sato, Kozo; Washizu, Shintaro; and Itoh, Isamu, 5,180,652, Cl. 430-281.000.
Fuji Photo Optical Co., Ltd.: *See*—
Shirie, Nobuyuki; and Ohno, Kazunori, 5,181,144, Cl. 359-700.000.
Fuji Seiki Inc.: *See*—
Taniguchi, Tsutomu, 5,179,974, Cl. 137-554.000.
Fuji Xerox Co., Ltd.: *See*—
Furuya, Nobumasa; Noami, Tsuneo; and Sumikawa, Takeshi, 5,181,072, Cl. 355-225.000.
Inasaki, Yutaka, 5,180,899, Cl. 219-469.000.
Nagao, Takashi, 5,181,261, Cl. 382-48.000.
Fujibayashi, Kentaro: *See*—
Sasaki, Takao; Fujibayashi, Kentaro; and Miyake, Masahiko, 5,181,178, Cl. 364-474.110.
Fujihisa, Hiroaki; and Sogabe, Manabu, to Mitsubishi Denki Kabushiki Kaisha. Remotely-controlled relay. 5,181,001, Cl. 335-14.000.
Fujii, Masahiro, to NEC Corporation. Terminal unit of a mobile communication system. 5,181,023, Cl. 340-825.460.
Fujii, Mutsuo: *See*—
Takeuchi, Yasuo; Fujii, Mutsuo; and Soejima, Hideo, 5,180,617, Cl. 428-71.000.

Fujii, Takeshi: *See*—
Abe, Hiroomi; Fujii, Takeshi; and Mitsui, Kiyoshi, 5,180,763, Cl. 524-112.000.
Nagasaki, Hideo; Inui, Naoki; Yachigo, Shinichi; Abe, Hiroomi; Fujii, Takeshi; and Yamamoto, Masashi, 5,180,764, Cl. 524-260.000.

Fujikawa, Yasuji: *See*—
Wakabayashi, Shigeru; Hirose, Shoji; Nishioka, Shoji; and Fujikawa, Yasuji, 5,180,356, Cl. 493-316.000.

Fujimoto, Hiroaki: *See*—
Tomioka, Hiroki; Sakamoto, Noriyasu; Umeda, Kimitoshi; Fujimoto, Hiroaki; Ishiwatari, Takao; and Kisida, Hirosi, 5,180,732, Cl. 514-396.000.

Fujinawa, Masaaki: *See*—
Kurosu, Yasuo; Yokoyama, Yoshihiro; Nishikawa, Kenichi; Masuzaki, Hidefumi; and Fujinawa, Masaaki, 5,181,260, Cl. 382-46.000.

Fujioka, Hiroshi, to Fujitsu Limited. Semiconductor growth process. 5,180,684, Cl. 437-110.000.

Fujirebio Kabushiki Kaisha: *See*—
Isowa, Yoshikazu; Sato, Yoshiaki; Nakashima, Yoshiharu; Masaki, Mitsuo; Miyake, Norihisa; Uehara, Masaki; and Hirate, Kenji, 5,180,712, Cl. 514-16.000.

Fujisawa Pharmaceutical Company, Ltd.: *See*—
Kato, Masayuki; Nishino, Shigetaka; Ito, Kiyotaka; and Takasugi, Hisashi, 5,180,728, Cl. 514-267.000.

Fujita, Harunori: *See*—
Ohmae, Tadayuki; Toyoshima, Yoshiki; Tanaka, Hisao; Okada, Mitsuyuki; and Fujita, Harunori, 5,180,784, Cl. 525-207.000.

Fujita, Mitsuhiro: *See*—
Sugimoto, Kenji; and Fujita, Mitsuhiro, 5,180,431, Cl. 118-52.000.

Fujita, Takeshi: *See*—
Kishimoto, Shoji; Marui, Shogo; and Fujita, Takeshi, 5,180,735, Cl. 514-443.000.
Kishimoto, Shoji; and Fujita, Takeshi, 5,180,738, Cl. 514-475.000.

Fujitsu Limited: *See*—
Akiyama, Takehiro; and Ogawa, Kazumi, 5,180,992, Cl. 331-11.000.
Fujioka, Hiroshi, 5,180,684, Cl. 437-110.000.
Kai, Junichi; Yasuda, Hiroshi; and Watanabe, Yoshio, 5,180,920, Cl. 250-492.200.
Ose, Yoshihisa; Sakamoto, Kiichi; and Yasuda, Hiroshi, 5,180,919, Cl. 250-492.200.
Shin, Teshiki, 5,180,466, Cl. 156-643.000.

Fujiwara, Kenichi: *See*—
Nakagaki, Nobufumi; Kurita, Toshiyuki; Murata, Toshinori; Kaizaki, Kazuhiro; Kubota, Sadao; Kamiya, Masanori; Sekiya, Hiroshi; and Fujiwara, Kenichi, 5,181,116, Cl. 358-159.000.

Fukasawa, Fumiaki; and Ikeda, Hiromichi, to Bridgestone Corporation. Heavy duty pneumatic tires. 5,180,453, Cl. 152-209.00R.

Fukatsu, Hironari: *See*—
Sakakibara, Shiro; Inuzuka, Takeshi; Hattori, Masashi; Fukatsu, Hironari; and Takaki, Shinichi, 5,179,867, Cl. 74-335.000.

Fukatsu, Yasushi, to Kabushiki Kaisha Toshiba. Method and apparatus for reading image using a line image sensor. 5,181,128, Cl. 358-486.000.

Fukaya, Katsuyoshi: *See*—
Iwata, Kouichi; and Fukaya, Katsuyoshi, 5,179,977, Cl. 137-625.500.

Fukazawa, Fumie; Irie, Yasushi; Shimazaki, Hiroshi; Yabuuchi, Katuya; and Shimba, Satoru, to Konica Corporation. Color photographic light-sensitive material offering excellent hue reproduction. 5,180,657, Cl. 430-503.000.

Fukke, Hajime; Akagi, Motoo; Matsuyama, Iwao; Katsumoto, Masayuki; Inoue, Hitoshi; Kodama, Naoki; and Uesaka, Yasutaro, to Hitachi, Ltd. Hard disk magnetic recording medium comprising magnetic powder and a binder and having a specified magnetic layer thickness and surface roughness. 5,180,616, Cl. 428-64.000.

Fukke, Hajime: *See*—
Chiba, Katsuyoshi; Katsumoto, Masayuki; Uesaka, Yasutaro; Fukke, Hajime; Ishihara, Heigo; Matsuyama, Iwao; Kodama, Naoki; Inoue, Hitoshi; and Terada, Yoshiharu, 5,180,608, Cl. 427-560.000.

Fukuchi, Hironao: *See*—
Miyashita, Yukio; Ohno, Hiroshi; Noguchi, Kunio; and Fukuchi, Hironao, 5,179,929, Cl. 123-688.000.

Fukuhara, Hiroshi: *See*—
Matsunaga, Fujihisa; Fukuhara, Hiroshi; and Yasuhara, Mitsuki, 5,180,871, Cl. 585-400.000.

Fukumoto, Katsumi: *See*—
Yamauchi, Yoshimitsu; Tanaka, Kenichi; Sakiyama, Keizo; and Fukumoto, Katsumi, 5,181,188, Cl. 365-228.000.

Fukushima, Hirotaka; and Takenaka, Mitsuhiko, to Kabushiki Kaisha Daikin Seisakusho. Liquid viscous damper. 5,180,044, Cl. 192-106.100.

Fukuyasu, Shigeki: *See*—
Itoh, Homare; Shin, Takashi; Yajima, Takahisa; and Fukuyasu, Shigeki, 5,180,672, Cl. 435-190.000.

Fullmer, David J.: *See*—
Vassiliadis, Arthur; Shaffer, Joseph W.; Fullmer, David J.; Brewer, Michael H.; Hennings, David R.; and Myers, Terry D., 5,180,304, Cl. 433-224.000.

Funagoshi, Tsutomu: *See*—
Inoue, Hiroshi; Takabayashi, Seiichirou; Muramatsu, Tadao; Funagoshi, Tsutomu; and Hirano, Tetsuji, 5,180,627, Cl. 428-214.000.

Funato, Reiko: *See*—
Akune, Kenichi; Watanabe, Naotaka; Inomiya, Yukihiro; Itoda, Hiroshi; Arai, Takeo; and Funato, Reiko, 5,180,473, Cl. 162-168.200.

Furch, Joseph A.: *See*—
Kuhn, David G.; Furch, Joseph A.; and Kamhi, Victor M., 5,180,734, Cl. 514-426.000.

Furukawa, Kenichi: *See*—
Sugie, Noboru; Furukawa, Kenichi; Ogawa, Makoto; Kurisu, Hironori; Mitsui, Tomonori; Aito, Akio; Nakamura, Mitsunori; and Mochizuki, Hiroshi, 5,181,197, Cl. 369-75.100.

Furukawa, Shinji; Oka, Kazuki; and Tanimura, Akira, to Unitika, Ltd. Thin-film magnetic material and process of production thereof. 5,181,020, Cl. 340-551.000.

Furuya, Nobumasa; Noami, Tsuneo; and Sumikawa, Takeshi, to Fuji Xerox Co., Ltd. Color recording apparatus. 5,181,072, Cl. 355-225.000.

Furuya, Yoshiyuki; Iino, Tadashi; and Aoki, Kunimitsu, to Yazaki Corporation. Display apparatus for automobiles. 5,181,012, Cl. 340-461.000.

Fuse, Eiichi: *See*—
Nagayoshi, Mitsugu; Miyazaki, Atsushi; Miyanaga, Hirofumi; Takehana, Sakae; Adachi, Hideyuki; Ueda, Yasuhiro; Fuse, Eiichi; and Aoki, Yoshisada, 5,179,934, Cl. 128-4.000.

Futamura, Nobuyuki: *See*—
Yoda, Sumio; Futamura, Nobuyuki; Hashimoto, Matsuo; and Saiki, Yoshifumi, 5,180,794, Cl. 525-487.000.

G. D. Searle & Co.: *See*—
Hanson, Gunnar J.; Baran, John S.; Weissing, Dave; and Russell, Mark, 5,180,725, Cl. 514-249.000.
Hanson, Gunnar J.; Baran, John S.; Weissing, Dave; and Russell, Mark, 5,180,744, Cl. 514-616.000.
Husa, Robert K.; Hallinan, E. Ann; Lesne, Michel; and Herin, Marc, 5,180,720, Cl. 514-211.000.

G. LeBlanc Corporation: *See*—
Biba, Gregory A., 5,180,191, Cl. 281-45.000.

G. S. Blodgett Corporation: *See*—
Alden, Lorne B.; Cole, James T.; Lockridge, James E.; and Costello, Thomas E., 5,180,898, Cl. 219-388.000.

Gabas, Carlos, to Industrias Techno-Matic S.A. Sun visor for automobiles. 5,180,202, Cl. 296-97.900.

Gadea Mantilla, Carlos E. Device for rotary torque enhancement. 5,179,876, Cl. 81-57.300.

Gadras, Alain; and Pepin, Regis, to Rhone-Poulenc Agrochimie. 2-(3-pyridyl) propanenitrile derivatives. 5,180,827, Cl. 546-14.000.

Gaffar, Abdul; Nabi, Nuran; Afflitto, John; and Stringer, Orum, to Colgate-Palmolive Company. Antibacterial antiplaque anticalculus oral composition. 5,180,578, Cl. 474-52.000.

Gala, Dinesh; Steinman, Martin; and Ganguly, Ashit, to Schering Corporation. Processes for preparing bicyclic compounds. 5,180,823, Cl. 544-212.000.

Galbraith, Patricia. Flag and buoy apparatus. 5,179,907, Cl. 116-209.000.

Gammill, Ronald B.; and Bell, Frank P., to Upjohn Company, The. Bivalent ligands effective for blocking ACAT enzyme for lowering plasma triglycerides and for elevating HDL cholesterol. 5,180,717, Cl. 514-63.000.

Gange, David M.; Guaciaro, Michael A.; and Doehner, Robert F., Jr., to American Cyanamid Company. Herbicidal 2-(2-imidazolin-2-yl)-benzo-(5-membered)-heterocycles and the use thereof. 5,180,419, Cl. 504-276.000.

Ganguly, Ashit: *See*—
Gala, Dinesh; Steinman, Martin; and Ganguly, Ashit, 5,180,823, Cl. 544-212.000.

Gao, Wei; and Vander Sande, John B., to Massachusetts Institute of Technology. Method for synthesis of high T_c superconducting materials by oxidation and press coating of metallic precursor alloys. 5,180,707, Cl. 505-1.000.

Gaon, David; and Wiedersatz, John, to TGTBT, Ltd. Process for preparing fat free snack chips. 5,180,601, Cl. 426-242.000.

Garito, Jon C.; and Ellman, Alan G. Medical demonstration model. 5,180,308, Cl. 434-262.000.

Garoche, Didier: *See*—
Grollier, Jean F.; Cotteret, Jean; and Garoche, Didier, 5,180,396, Cl. 8-405.000.
Grollier, Jean F.; Cotteret, Jean; and Garoche, Didier, 5,180,397, Cl. 8-405.000.
Grollier, Jean F.; Cotteret, Jean; and Garoche, Didier, 5,180,399, Cl. 8-405.000.

Garrish, Bryan F.: *See*—
Harrison, Richard H., Jr.; and Garrish, Bryan F., 5,180,103, Cl. 239-1.000.

Garrison, Michi E., to Advanced Cardiovascular Systems, Inc. Rapidly exchangeable and expandable cage catheter for repairing damaged blood vessels. 5,180,368, Cl. 604-104.000.

Gartner, Ellis M.; and Ferraris, Chiara F., to W.R. Grace & Co.-Conn. Concrete surface air void reduction admixture. 5,180,430, Cl. 106-730.000.

Garverick, Steven L.: *See*—
Yassa, Fathy F.; and Garverick, Steven L., 5,181,033, Cl. 341-143.000.

Gas Research Institute: *See*—
Hsieh, Paonan; McComis, William T.; Senapati, Nagabhusan; Stulen, Foster B.; and Paul, Darrell D., 5,180,600, Cl. 426-233.000.

Gates, Geoffrey W.: *See*—
Saltwick, John M.; Scarinci, Dean; Sparks, William O.; and Gates, Geoffrey W., 5,181,243, Cl. 380-6.000.

Gaucher, Ronald: *See*—
Berube, Martin; Bilodeau, Julien; Paul, Marlene; Gaucher, Ronald; Cote, Germain; and Boudreault, Guy, 5,179,982, Cl. 141-20.000.

Gaudlitz, Robert, to Union Special Corporation. Oil pumps for sewing machines. 5,180,035, Cl. 184-6.150.

Gault, R. H.: *See*—
Wenholz, Bruce; Gault, R. H.; and Jones, Kerry A., 5,180,289, Cl. 417-53.000.

Gawinski, Hubertus: *See*—
Schneider, Eckhard; and Gawinski, Hubertus, 5,180,146, Cl. 267-64.270.

Gaylord, Norman G.: *See*—
Park, John J.; Katz, Leon; and Gaylord, Norman G., 5,180,751, Cl. 521-51.000.

GD. S.p.A.: *See*—
Osti, Roberto; and Minarelli, Alessandro, 5,179,814, Cl. 53-75.000.

GEC-Marconi Limited: *See*—
Bagshaw, John M.; and Bowles, Donald C., 5,181,013, Cl. 340-702.000.
McEwen, Robert K.; and MacLeod, Alan D., 5,180,912, Cl. 250-234.000.

Geddie, John D., to General Motors Corporation. Vehicle headlamp assembly. 5,180,219, Cl. 362-61.000.

Gedon, Steven: *See*—
Bagrodia, Shriram; Fagerburg, David R.; Gedon, Steven; Watkins, Joseph J.; Lawrence, Paul B.; and Rule, Mark, 5,180,775, Cl. 525-64.000.

Gegenheimer, Harold W.; and Roberts, Webster C., to Gegenheimer, Harold W. Method and apparatus for maintaining confidential printed-sheet output. 5,180,153, Cl. 270-53.000.

Gehlsen, Kurt R.: *See*—
Ruoslahti, Erkki I.; Engvall, Eva; and Gehlsen, Kurt R., 5,180,809, Cl. 530-350.000.

Gehrke, Bodo, to EVT Energie- und Verfahrenstechnik GmbH. Pulverizing technique and rolling mill for use therein. 5,180,113, Cl. 241-79.100.

Gehrs, Donald F.; and Runge, Louis L., to Westinghouse Electric Corp. Panelboard with insulative snap-in support means. 5,181,165, Cl. 361-355.000.

Gelin, Claude; and Bordino, Christian, to Cegelec. Connector for shielded pair cable with grounding drain conductor. 5,180,314, Cl. 439-394.000.

Gename, John L.; and Evensen, David P., to Nimlok Company. Panel system. 5,179,810, Cl. 52-240.000.

Genencor International, Inc.: *See*—
Antrim, Richard L., 5,180,669, Cl. 435-99.000.

General Dynamics Corporation/Space Systems Division: *See*—
Cornwall, Mickey; Peterson, David M.; and Stern, Theodore G., 5,180,441, Cl. 136-246.000.

General Dynamics Land Systems Inc.: *See*—
Schauss, Craig A.; Neumann, Donald E.; and Bielawski, Dennis A., 5,181,201, Cl. 370-85.100.

General Electric Company: *See*—
Lenhart, Kenneth J.; Barron, Michael L.; Wakeman, Thomas G.; and Bellia, Donald L., 5,180,282, Cl. 415-209.200.
Lopes, Wiliam F., 5,180,034, Cl. 184-6.100.
Peterson, William A.; Elmore, Michael S.; and Sherwood, Steven D., 5,181,159, Cl. 363-89.000.
Renlund, Gary M.; Lewis, Larry N.; Stein, Judith; and Bracco, Angelo A., 5,180,694, Cl. 501-12.000.
Ribner, David B., 5,181,032, Cl. 341-143.000.
Van Kuijk, Rudolf M., 5,180,546, Cl. 376-371.000.
Van Kuijk, Rudolf M., 5,180,547, Cl. 376-377.000.
Wengrovius, Jeffrey H.; and Van Valkenburgh, Virginia M., 5,180,801, Cl. 528-15.000.
Yassa, Fathy F.; and Garverick, Steven L., 5,181,033, Cl. 341-143.000.
Zarnoch, Kenneth P., 5,180,639, Cl. 428-412.000.

General Motors Corporation: *See*—
Abdul, Abdul S., 5,180,013, Cl. 166-370.000.
Abousabha, Naji G.; and Tran, Khanh C., 5,180,292, Cl. 417-273.000.
Ament, Frank, 5,179,926, Cl. 123-494.000.
Charles, Harlan W.; and Miller, Larry D., 5,180,186, Cl. 280-714.000.
Cicatello, Samuel; and Macartney, Robert M., 5,179,892, Cl. 100-32.000.
Frantz, Brian H.; Jensen, Jack L.; and Miller, Gregory A., 5,180,188, Cl. 280-740.000.
Geddie, John D., 5,180,219, Cl. 362-61.000.
Halstead, Gary A.; Barten, Brian L.; and Trentacoste, Terence, 5,180,098, Cl. 228-183.000.
Hellyer, Richard A.; Wagner, James R.; Pees, James M.; and Lohmann, Detlef, 5,180,144, Cl. 267-64.190.
Hunter, Joseph H., 5,179,874, Cl. 74-733.100.
Kent, Scott E., 5,180,291, Cl. 417-273.000.
Lyman, Tommy L.; and Newman, Kenneth B., 5,179,844, Cl. 62-503.000.
McLane-Goetz, Lee A. M.; Laramie, Matthew J.; McClelland, Kevin L.; McCormick, Robert L.; and Schultz, Allen L., 5,180,279, Cl. 415-177.000.
Moreno, Ricardo H., 5,180,189, Cl. 280-779.000.
Nguyen, Hung P., 5,180,004, Cl. 165-140.000.
Swain, James C.; and Wilcox, John P., 5,180,295, Cl. 418-55.300.
Vahabzadeh, Hamid; and Koivunen, Erkki A., 5,180,340, Cl. 474-111.000.
Vahabzadeh, Hamid; and Koivunen, Erkki A., 5,180,341, Cl. 474-111.000.
Wintersteen, Douglas C.; Hamilton, Lynn R.; Mikesell, Donald E.; and Sheets, Gerald R., 5,179,780, Cl. 29-890.070.

General Motors of Canada Limited: *See*—
Orminski, John K., 5,179,925, Cl. 123-491.000.

General Tire, Inc.: *See*—
Brown, Robert L.; Codispoti, Thomas E.; and Dunaway, Kenneth W., 5,179,806, Cl. 51-165.710.

Gentile, Robert L.: *See*—
Griffiths, Warren J.; and Gentile, Robert L., 5,179,825, Cl. 56-400.050.

Georgia Tech Research Corporation: *See*—
Powers, James C.; May, Sheldon W.; Hernandez, Maria A.; Thornton, Steve; and Glinski, Jan, 5,180,831, Cl. 546-291.000.

Georgopoulos, George; and Gnoinski, Richard, to E. J. Brooks. Rotatable seal. 5,180,200, Cl. 292-326.000.

Gephart, Robert J., Jr. Counter-revolving display carousel. 5,179,796, Cl. 40-473.000.

Gerace, Jeffrey T.; Plotts, Alan E.; and Abendschein, Frederic H., to AMP Incorporated. Sheath connector for an optical cable. 5,181,267, Cl. 385-86.000.

Gerardus, Johannes J.; and Doeksen, Doeke K., to Koninklijke Ptt Nederland N.V. Digital optical switch. 5,181,262, Cl. 385-16.000.

Gerber, Arthur H., to Borden, Inc. Retarders for hardening phenolic resins. 5,180,795, Cl. 525-504.000.

Geschwender, Robert C. Dispenser and method of viewing granular dry matter as it is being dispensed. 5,180,080, Cl. 222-1.000.

Gesin, Milford M.: *See*—
Postma, Stephen J.; Gesin, Milford M.; Demma, Nick A.; Bjork, Paul E.; and Wagener, Thomas J., 5,180,978, Cl. 324-207.160.

Getac Corporation: *See*—
Chen, Yen-Chin, 5,180,237, Cl. 400-479.000.

Gethmann, Douglas P.; and Fagerlund, Allen C., to Fisher Controls International, Inc. Rotary ball fluid control valve with noise attenuator. 5,180,139, Cl. 251-127.000.

GEZE Sport International GmbH: *See*—
Bogner, Martin, 5,180,183, Cl. 280-629.000.

Ghadjar, Fathali G.: *See*—
Ghajar, Jamshid B. G.; Hariri, Robert J.; and Ghadjar, Fathali G., 5,180,387, Cl. 604-266.000.

Ghajar, Jamshid B. G.; Hariri, Robert J.; and Ghadjar, Fathali G., to Neurodynamics, Inc. Angled hole ventricular catheter with non-circular bore. 5,180,387, Cl. 604-266.000.

Ghazarossian, Vartan; Kung, Viola T.; and Zuk, Robert F., to Molecular Devices Corporation. Chromophoric reagents for incorporation of biotin or other haptens into macromolecules. 5,180,828, Cl. 546-37.000.

Giancaterino, James A.; and Walsh, Bruce, to Reliance Comm/Tec Corporation. Apparatus for temperature compensating one or more battery chargers. 5,180,962, Cl. 320-35.000.

Giat Industries: *See*—
Simon, Georges H.; Pichot, Patrice J.; and Boissau, Alain J. M., 5,180,879, Cl. 89-33.170.

Gibbard, Howard C., to Imperial Chemical Industries PLC. Stabilization of fluoropolymers. 5,180,803, Cl. 528-488.000.

Gibby, Gordon L.; Lampotang, Samsun; Hathiram, Daraius; and Gravenstein, Nikolaus, to University of Florida. System and method for in-line heating of medical fluid. 5,180,896, Cl. 219-10.55A.

Gidanian, Bijan: *See*—
Moore, Henry J., Jr.; Gidanian, Bijan; and Deneau, Myron E., 5,179,914, Cl. 122-17.000.

Giddings & Lewis, Inc.: *See*—
Schroeder, Richard L., 5,179,809, Cl. 51-288.000.

Giglia, Robert D., to American Cyanamid Company. Fibrillated fibers and articles made therefrom. 5,180,630, Cl. 428-224.000.

Gilbert Engineering Company, Inc.: *See*—
Down, William J.; and Hayward, Robert D., 5,179,877, Cl. 81-443.000.

Gilbert, Jeffrey S.; and Desmarais, Brett A., to Carrier Corporation. Temperature control system for zoned space. 5,180,102, Cl. 236-49.300.

Gilby, Anthony C.: *See*—
Jeannotte, Anthony C.; Gilby, Anthony C.; Cheney, M. Charles; and Meneghelli, Barry J., 5,181,082, Cl. 356-436.000.

Gillespie, Elgene R. Safety hypodermic syringe with retractable needle. 5,180,370, Cl. 604-110.000.

Ginsburg, Robert. Valved self-perfusing catheter guide. 5,180,364, Cl. 604-53.000.

Girvin, Robert H., to Ocean State International, Inc. Bicycle crank assembly. 5,179,873, Cl. 74-594.100.

Gisin, Paul: *See*—
Frigg, Robert; Perren, Stephan; Allgower, Martin; and Gisin, Paul, 5,180,382, Cl. 606-65.000.

Givaudan-Roure Corporation: *See*—
Etzweiler, Franz; Helmlinger, Daniel; Nussbaumer, Cornelius; and Pesaro, Mario, 5,180,709, Cl. 512-17.000.

Given, Bruce A.: *See*—
Wang, Mansheng; and Given, Bruce A., 5,180,625, Cl. 428-212.000.

Given, Michael S.; and Wright, Joe W., to Twist Inc. Brake cylinder piston spring. 5,180,149, Cl. 267-180.000.

Glinski, Jan: *See—*
Powers, James C.; May, Sheldon W.; Hernandez, Maria A.; Thornton, Steve; and Glinski, Jan, 5,180,831, Cl. 546-291.000.
Glynn, Brian J., to Triton Technologies, Inc. Computer apparatus input device for three-dimensional information. 5,181,181, Cl. 364-566.000.
Gnoinski, Richard: *See—*
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Goble, Greg: *See—*
Mackay, Donald; Paul, Joseph; and Goble, Greg, 5,181,049, Cl. 316-140.00R.
Goda, Yoshihiko: *See—*
Kato, Toshio; Miyazawa, Yorikatu; Shibazaki, Osamu; and Goda, Yoshihiko, 5,179,855, Cl. 72-401.000.
Godfrey, Craig W.: *See—*
Dickson, Rennie L.; Godfrey, Craig W.; Schwendemann, Kenneth L.; and Noack, Timothy J., 5,179,973, Cl. 137-433.000.
Goe, Melvin B., Jr.; and Yager, Carl W., to A. B. Chance. Phase barier for padmounted switchgear. 5,181,158, Cl. 361-335.000.
Goe, Melvin B., Jr.: *See—*
Beard, Lloyd R.; and Goe, Melvin B., Jr., 5,181,164, Cl. 361-345.000.
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Fleckenstein, Theo; Goebel, Gerd; Carduck, Franz-Josef; Demmering, Guenther; and Kubersky, Hans-Peter, 5,180,858, Cl. 568-885.000.
Gold Star Co., Ltd.: *See—*
Ji, Heon Pyeong, 5,180,040, Cl. 191-12.20R.
Goldstar Co., Ltd.: *See—*
Ho, Chang D., 5,181,113, Cl. 358-142.000.
Goldstein, Joel E.: *See—*
Mao, Chung-Ling; Goldstein, Joel E.; and Iacoviello, John G., 5,180,772, Cl. 324-816.000.
Gomez, Greg M: *See—*
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Gomi, Hideyuki; Hozumi, Tatsunobu; Hattori, Shizuo; Tagawa, Chiaki; Kishimoto, Fumitaka; and Bjorck, Lars, to Sumitomo Chemical Co., Limited; and HighTech Receptor AB. Protein H capable of binding to IgG. 5,180,810, Cl. 530-350.000.
Gomi, Katsushige: *See—*
Arai, Hitoshi; Kono, Motomichi; Kasai, Masaji; Gomi, Katsushige; and Ashizawa, adashi, 5,180,825, Cl. 544-318.000.
Good Shepherd Rehabilitation Hospital, The: *See—*
Letechipia, Jorge, 5,180,181, Cl. 280-304.100.
Goodrell, Guy I.: *See—*
Panzica, Patricia S.; and Goodrell, Guy I., 5,180,171, Cl. 273-428.000.
Goodrich, Ronald W.: *See—*
Czech, Edward A.; Goodrich, Ronald W.; and Crawford, Kevin L., 5,180,275, Cl. 414-541.000.
Goodwin, James E.: *See—*
Sam, Richard C.; Leslie, Kenrick R.; and Goodwin, James E., 5,181,215, Cl. 372-34.000.
Gorelick, Steven M.; and Gvirtzman, Haim, to Leland Stanford Junior University, The Board of Trustees of the. In-situ vapor stripping for removing volatile organic compounds from groundwater. 5,180,503, Cl. 210-758.000.
Gorman-Rupp Company, The: *See—*
Hansen, Milton N.; and McMahon, Steven D., 5,180,297, Cl. 418-104.000.
Goto, Giichi; Nagaoka, Akinobu; and Ishihara, Yuji, to Takeda Chemical Industries, Ltd. Aralkylamine compounds. 5,180,746, Cl. 514-654.000.
Goto, Shigeo: *See—*
Usagawa, Toshiyuki; Imamura, Yoshinori; Okuhira, Hidekazu; Goto, Shigeo; Kobayashi, Masayoshi; and Takatani, Shinichiro, 5,181,087, Cl. 257-194.000.
Goto, Yasuyuki: *See—*
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Gotoh, Nobuo: *See—*
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Gottlieb, Mark; and Roche, Tom, to Designtech International, Inc. Weighted transducer and driving circuit with feedback. 5,181,019, Cl. 340-474.000.
Gottling, Helmut: *See—*
Moller, Rudolf; Brausfeld, Walter; Gottling, Helmut; Scharnowski, Gerhard; and Muller, Peter, 5,180,318, Cl. 439-716.000.
Goudy, John W. Truck box tarpaulin assembly. 5,180,203, Cl. 296-98.000.
Gough, Michael J.: *See—*
Neu, Max G.; and Gough, Michael J., 5,180,759, Cl. 523-141.000.
Goulait, David J. K.: *See—*
Thomas, Dennis A.; Goulait, David J. K.; and Cox, Robert G., Jr., 5,180,534, Cl. 264-145.000.
Gould, Hannah J.; and Helm, Birgit A., to Research Corporation Limited. Polypeptide competitor for immunoglobulin E. 5,180,805, Cl. 530-324.000.
Gould, Joel M.: *See—*
Frey, Alexander H., Jr.; Gould, Joel M.; and Higgins, Charles M., Jr., 5,181,017, Cl. 340-825.020.
Gradco (Japan) Ltd.: *See—*
Coombs, Peter M., 5,180,158, Cl. 271-293.000.
Grand, Jean-Paul; Juvigny, Daniel; Vinuesa, Andre ; and Tortosa, Serge, to Sollac. Method of continuously casting a liquid metal using stream protection tube. 5,180,537, Cl. 266-45.000.
Grant, Louis A., Jr., to Louis A. Grant, Inc. Apparatus for descaling a process vessel. 5,179,757, Cl. 15-246.500.
Granville Group, Inc., The: *See—*
Granville, J. Michael, 5,181,026, Cl. 340-870.280.
Granville, J. Michael, to Granville Group, Inc., The. Power transmission line monitoring system. 5,181,026, Cl. 340-870.280.
Grattier, Bernard, to Framatome; and Cogema. Lower end nozzle of a fuel assembly having a particle retention device and fuel assembly having such an end nozzle. 5,180,545, Cl. 376-352.000.
Gravenstein, Nikolaus: *See—*
Gibby, Gordon L.; Lampotang, Samsun; Hathiram, Daraius; and Gravenstein, Nikolaus, 5,180,896, Cl. 219-10.55A.
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Kennedy, Gerald R., Jr., 5,180,386, Cl. 606-240.000.
Gray, Thomas R.: *See—*
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Great Health, Enrich Life China Tasty Food Co., Ltd.: *See—*
Chiu, Yao-Jui, 5,179,891, Cl. 99-408.000.
Great Lakes Chemical Corporation: *See—*
Timberlake, Larry D.; and Brennan, James L., 5,180,859, Cl. 568-946.000.
Grecksch, Hans; and Paetzold, Frank, to W. Schlafhorst AG & Co. Combined textile yarn spinning and winding system having spinning tube transporting means. 5,179,829, Cl. 57-281.000.
Green, Alan C., to Lucas Industries. Fuel injection pumping apparatus. 5,180,290, Cl. 417-218.000.
Green, David T.; Bolanos, Henry; and Sienkiewicz, Henry, to United States Surgical Corporation. Valve system for introducing objects into anatomical body portions. 5,180,373, Cl. 604-167.000.
Greene, Richard M. Graphic input device with uniform sensitivity and no keystone distortion. 5,181,108, Cl. 358-93.000.
Greenlee, Fredrick E.; and Barnhardt, Charles T. Apparatus for plastic body panel attachment. 5,180,267, Cl. 411-432.000.
Gregory, H. Scott, Jr.: *See—*
Close, Richard C.; Gregory, H. Scott, Jr.; and Walker, Douglas G., 5,181,124, Cl. 358-300.000.
Grieb, Hubert: *See—*
Hanser, Hagen; and Grieb, Hubert, 5,180,249, Cl. 403-28.000.
Grieve, Donald F., to Krebs Engineers. Rotating hydrocyclone separator with turbulence shield. 5,180,493, Cl. 210-512.300.
Griffiths, Gareth; Warm, Aleksander; Previdoli, Felix; and Ryan, Gary, to Lonza Ltd. Process for the production of 1-(*n*-methanesulfonyl-*n*-methylaminosulfonyl)-3-(2-pyrimidyl) urea derivatives. 5,180,826, Cl. 544-332.000.
Griffiths, Warren J.; and Gentile, Robert L. Sand rake. 5,179,825, Cl. 56-400.050.
Grollier, Jean F.; Cotteret, Jean; and Garoche, Didier, to L'Oreal. Process for dyeing keratinous fibres with oxidation dyes combined with indole derivatives and dyeing composition employed. 5,180,396, Cl. 8-405.000.
Grollier, Jean F.; Cotteret, Jean; and Garoche, Didier, to L'Oreal. Process for dyeing keratinous fibres with couplers and/or "rapid" oxidation dyes combined with an iodide and dyeing composition employed. 5,180,397, Cl. 8-405.000.
Grollier, Jean F.; Cotteret, Jean; and Garoche, Didier, to L'Oreal. Process for dyeing keratinous fibres with oxidation bases combined with an iodide and dyeing composition employed. 5,180,399, Cl. 8-405.000.
Gross, Daniel. Air-oil burner. 5,180,301, Cl. 431-116.000.
Grossman, Barry G.; and Caimi, Frank M., to Harbor Branch Oceanographic Institution, Inc.; and Florida Institute of Technology, Inc., The. Parameter measurement systems and methods having a neural network comprising parameter output means. 5,180,911, Cl. 250-227.210.
Grutter, Markus G.; Heinz, Dirk; and Liersch, Manfred, to Ciba-Geigy Corporation; and UCP Gen-Pharma, AG. Genes encoding eglin C mutants. 5,180,667, Cl. 435-69.200.
GSW Inc.: *See—*
Lewis, Brian, 5,180,077, Cl. 220-444.000.
GTE Products Corporation: *See—*
Lai, Wen-Chao; Rourke, William J.; and Natansohn, Samuel, 5,180,563, Cl. 423-21.500.
GTE Valenite Corporation: *See—*
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Guaciaro, Michael A.: *See—*
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Guerder, Pierre: *See—*
Le Moigne, Jacques; Thierry, Annette; and Guerder, Pierre, 5,180,463, Cl. 156-603.000.
Gueret, Jean-Louis H., to L'Oreal. Process for compacting a pulverulent mixture on a support and make-up applicator formed by a support provided with a pellet of compacted pulverulent mixture. 5,180,240, Cl. 401-88.000.
Gueret, Jean-Louis H., to L'Oreal. Applicator for a thixotropic product, especially a mascara. 5,180,241, Cl. 401-122.000.
Guerin, Jean-Claude; and Morel, Philippe, to Thomson Comsumer Eletronics. Procedure and device for the automatic correction of skew, of color superimposition, and of image uniformity for television cameras. 5,181,098, Cl. 358-10.000.

Guha, Subhendu: *See*—
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Czubatyj, Wolodymyr; Ovshinsky, Stanford R.; Wicker, Guy C.; Beglau, David; Himmler, Ronald; Jablonski, David; and Guha, Subhendu, 5,180,690, Cl. 437-233.000.
Gunze Limited: *See*—
Itaya, Hisao; Akebi, Kazuhiko; Okabe, Minoru; and Nakagawa, Satoru, 5,181,030, Cl. 341-20.000.
Gupton, Donald W. Floor sanding device. 5,179,807, Cl. 51-174.000.
Gustafsson, Bengt-Goran: *See*—
Andersson, Joachim; and Gustafsson, Bengt-Goran, 5,180,147, Cl. 267-136.000.
Gutag Innovations AG: *See*—
Guttinger, Kurt, 5,180,336, Cl. 464-102.000.
Guth, Jules H.: *See*—
Crane, Lori A.; Hynes, John T.; Guth, Jules H.; and Strandholm, John J., 5,180,604, Cl. 426-582.000.
Gutteridge, Ronald J.; and Ristic, Ljubisa, to Motorola Inc. Micromachined capacitor structure and method for making. 5,181,156, Cl. 361-283.000.
Guttinger, Kurt, to Gutag Innovations AG. Oldham coupling. 5,180,336, Cl. 464-102.000.
Guzowski, Matthew M.: *See*—
Sigworth, Geoffrey K.; and Guzowski, Matthew M., 5,180,447, Cl. 148-437.000.
Gvirtzman, Haim: *See*—
Gorelick, Steven M.; and Gvirtzman, Haim, 5,180,503, Cl. 210-758.000.
Gyurovits, John S. Timing-range gear. 5,179,918, Cl. 123-90.170.
Ha, Jae M.; Jeong, Kwang L.; and Suh, Sung S., to Lucky, Ltd. Composition for enhancing oral hygiene, containing bamboo-salt. 5,180,575, Cl. 404-49.000.
Haardt, Udo; Seiler, Erhard; Tatzel, Hermann; Schwager, Harald; and Domas, Friedrich, to BASF Aktiengesellschaft. Shock-absorbing propylene polymer composite moldings. 5,180,628, Cl. 428-215.000.
Habermann, Paul: *See*—
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Habsburg-Lothringen, Sandor, to Axis USA, Incorporated. Apparatus for applying a powdered coating to a workpiece. 5,179,910, Cl. 118-634.000.
Haddad, Edward N., Jr., to Pioneer Consolidated Corporation. Receptacle cover. 5,179,991, Cl. 160-310.000.
Haddleton, David M.: *See*—
Ballard, Denis G. H.; Haddleton, David M.; and Twose, David L., 5,180,799, Cl. 526-177.000.
Hadewe B. V.: *See*—
van der Werff, Jeichienus A., 5,179,820, Cl. 53-492.000.
Hafner, Dieter. Device for the storage and time-regulated dispensing of drugs. 5,181,189, Cl. 368-10.000.
Hagenauer, Joachim; and Hoher, Peter, to Deutsche Forschungsanstalt Fur Luft- Und Raumfahrt E.V. Method for generalizing the viterbi algorithm and devices for executing the method. 5,181,209, Cl. 371-43.000.
Hager, Michael J.: *See*—
Ziebarth, Michael S.; Hager, Michael J.; Beeckman, Jean W.; and Plecha, Stanislaw, 5,180,703, Cl. 502-243.000.
Hagiya, Naoyuki, to Akebono Brake Industry Co., Ltd. Traction control system for motor vehicles. 5,180,027, Cl. 180-197.000.
Hake, John: *See*—
Yamaguchi, Makoto; Hake, John; Okamura, Kazuo; and Minami, Kiyoshi, 5,180,494, Cl. 210-603.000.
Haley, William J.; and Swanson, Glenn E., to Borg-Warner Automotive, Inc. Double acting secondary sheave servo for a continuously variable transmission. 5,180,339, Cl. 474-28.000.
Hall, David V., to Interroll Holding A.G. Motorized pulley with internal mounts. 5,180,344, Cl. 474-148.000.
Halliburton Company: *See*—
Kersey, Joe B.; and Davis, Gail F., 5,180,190, Cl. 280-838.000.
Manke, Kevin R.; Ringgenberg, Paul D.; and Schultz, Roger L., 5,180,007, Cl. 166-321.000.
Ringgenberg, Paul D.; and Manke, Kevin R., 5,180,015, Cl. 166-386.000.
Hallinan, E. Ann: *See*—
Husa, Robert K.; Hallinan, E. Ann; Lesne, Michel; and Herin, Marc, 5,180,720, Cl. 514-211.000.
Halloran, Daniel J.; and Handt, Christine M., to Dow Corning Corporation. Hairstyling preparations containing amidofunctional siloxanes. 5,180,580, Cl. 424-71.000.
Halozan, Scott F.: *See*—
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Halstead, Gary A.; Barten, Brian L.; and Trentacoste, Terence, to General Motors Corporation. Air conditioner condenser assembly. 5,180,098, Cl. 228-183.000.
Hama, Mamoru; Mitsuyoshi, Matao; and Hashimoto, Takahiro, to Kabushiki Kaisha Mihama Seisakusho; and Yugen Kaisha Aoi Shoji. Medical apparatus using ozone gas. 5,179,943, Cl. 128-368.000.
Hamada, Toshihiko, to Teac Corporation. Rotary head assembly for substantially concurrent recording and monitoring of data on a magnetic tape cassette or the like. 5,181,147, Cl. 360-31.000.
Hamamatsu Photonics K.K.: *See*—
Kyushima, Hiroyuki, 5,180,943, Cl. 313-535.000.
Suyama, Motohiro, 5,180,908, Cl. 250-214.0VT.
Hamamoto, Kimihiko: *See*—
Ichikawa, Yataro; Hamamoto, Kimihiko; and Tokashiki, Michiyuki, 5,180,676, Cl. 435-240.100.
Hamanaka, Tatsuo: *See*—
Hikasa, Tadashi; Ibuki, Koichiro; Hamanaka, Tatsuo; and Mizumori, Motoo, 5,180,769, Cl. 524-525.000.
Hamatani, Tomio: *See*—
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Hamilton, Lynn R.: *See*—
Wintersteen, Douglas C.; Hamilton, Lynn R.; Mikesell, Donald E.; and Sheets, Gerald R., 5,179,780, Cl. 29-890.070.
Hamm, Dietrich: *See*—
Muller, Manfred; Henseler, Wolfgang; Katz, Egon; Bossenmaier, Alban; and Hamm, Dietrich, 5,180,187, Cl. 280-732.000.
Hamm, Donald J., to CPC International Inc. Process for the production of hydrolyzed vegetable proteins using gaseous hydrochloric acid and the product therefrom. 5,180,597, Cl. 426-52.000.
Hammer Corporation: *See*—
Jones, Gary A., 5,180,354, Cl. 482-133.000.
Han, Tack D.; and Moh, Sang M., to Samsumg Electronics Co., Ltd. Parallel multiplier using skip array and modified wallace tree. 5,181,185, Cl. 364-760.000.
Hancock, Sean J.: *See*—
Ngo, Viet H.; Poole, Warren D.; Hancock, Sean J.; and France, Timothy T., 5,180,501, Cl. 210-747.000.
Handfield, Louis, to Turbines S.M.S. Inc. Snow making machine. 5,180,106, Cl. 239-14.200.
Handt, Christine M.: *See*—
Halloran, Daniel J.; and Handt, Christine M., 5,180,580, Cl. 424-71.000.
Hanna, Michael, Jr.; Haspel, Martin V.; and Hoover, Herbert C., Jr., to Akzo N.V. Tumor specific monoclonal antibodies. 5,180,814, Cl. 530-388.800.
Hansen, Keith J., to LSI Logic Corporation. Apparatus for conducting a refractory metal deposition process. 5,180,432, Cl. 118-697.000.
Hansen, Milton N.; and McMahon, Steven D., to Gorman-Rupp Company, The. Fluid transfer pump with shaft seal structure. 5,180,297, Cl. 418-104.000.
Hanser, Hagen; and Grieb, Hubert, to MTU Motoren-Undturbinen-Union Munchen GmbH. Thermally stressed, torsionally rigid connection. 5,180,249, Cl. 403-28.000.
Hanson, Gunnar J.; Baran, John S.; Weissing, Dave; and Russell, Mark, to G. D. Searle & Co. Quinoxalinyl/quinoxaliy; alkyl-N-terminal amino hydroxy. 5,180,725, Cl. 514-249.000.
Hanson, Gunnar J.; Baran, John S.; Weissing, Dave; and Russell, Mark, to G. D. Searle & Co. Aralkyl-N-terminal amino hydroxy. 5,180,744, Cl. 514-616.000.
Hara, Hiromu: *See*—
Mase, Toshiyasu; Tsuzuki, Ryuji; Hara, Hiromu; Murase, Kiyoshi; and Tomioka, Kenichi, 5,180,730, Cl. 514-348.000.
Hara, Masaharu, to Nikon Corporation. Flexible printed board for use in cameras. 5,181,065, Cl. 354-485.000.
Harada, Chikao; Kawamura, Norio; Nakashima, Ryuji; Takahashi, Arihiro; Yamazaki, Toshimasa; Yasui, Masanobu; and Kondo, Tatsushi, to Colin Electronics Co., Ltd. Contact pressure sensor. 5,179,956, Cl. 128-672.000.
Harada, Hajime, to Nihon Kohden Corporation. Sampling method and circuit. 5,180,931, Cl. 307-353.000.
Harada, Ichiya: *See*—
Kiyohara, Kazuto; Araki, Hiromitsu; Yamazaki, Toshiaki; and Harada, Ichiya, 5,180,658, Cl. 430-533.000.
Harada, Keizo; Hattori, Hisao; and Itozaki, Hideo, to Sumitomo Electric Industries, Ltd. Process and apparatus for preparing superconducting thin films. 5,180,708, Cl. 505-1.000.
Harada, Naoki: *See*—
Ogino, Kazuya; Akahori, Kingo; and Harada, Naoki, 5,180,817, Cl. 534-811.000.
Harase, Toshikatsu: *See*—
Orimoto, Masaaki; Harase, Toshikatsu; and Mizuno, Masahiko, 5,179,871, Cl. 74-516.000.
Harazoe, Hirofumi; Shiromoto, Hiroyoshi; Yagi, Kazuo; and Kouya, Masahiro, to Mitsui Petrochemical Industries Ltd. Rope for traction. 5,180,636, Cl. 428-373.000.
Harbor Branch Oceanographic Institution, Inc.: *See*—
Grossman, Barry G.; and Caimi, Frank M., 5,180,911, Cl. 250-227.210.
Harding, Stephen A.: *See*—
Foltz, Gilbert H., Jr.; and Harding, Stephen A., 5,179,919, Cl. 123-143.00C.
Hardy Manufacturing, Inc.: *See*—
Vargo, William R., 5,180,068, Cl. 211-191.000.
Hariri, Robert J.: *See*—
Ghajar, Jamshid B. G.; Hariri, Robert J.; and Ghadjar, Fathali G., 5,180,387, Cl. 604-266.000.
Harmonic Lightwaves, Inc.: *See*—
Berger, Josef; Mick, Doron; and Kleefeld, Joseph, 5,181,214, Cl. 372-34.000.
Harrington, Thomas E., III; and Lee, Robert D., to Dallas Semiconductor Corp. Integrated circuit with improved protection against negative transients. 5,181,091, Cl. 257-355.000.
Harris Corp.: *See*—
Chapman, Daniel H., 5,181,207, Cl. 371-37.400.
Harris, James B.: *See*—
Thurman, Laurance R.; and Harris, James B., 5,180,847, Cl. 560-238.000.

Harris, William C., Jr.: *See*—
Chance, Christopher N.; DeBlasio, James A.; Evers, Donald H.; Harris, William C., Jr.; Kirby, Michael A., Sr.; Newsome, Reginald W.; and Talley, Robert E., 5,180,055, Cl. 206-256.000.

Harrison, Colin G., to International Business Machines Corporation. Handoff method and apparatus for mobile wireless workstation. 5,181,200, Cl. 370-85.100.

Harrison, John M. M., to J.M. Huber Corporation. Flotation aid and process for removal of impurities from silicate minerals. 5,180,511, Cl. 252-61.000.

Harrison, Richard H., Jr.; and Garrish, Bryan F., to AMSTED Industries Incorporated. Spray nozzle fluid distribution system. 5,180,103, Cl. 239-1.000.

Hart, Thomas G., to American Standard Inc. Controlled flow dispensing unit. 5,180,111, Cl. 239-590.000.

Hartl, Hans-georg, to Hewlett-Packard Company. Thermoelectrically cooled pumping system. 5,180,293, Cl. 417-366.000.

Hartman, Terrence L.; and Cody, Charles A., to Rheox, Inc. Monoamine capped non-reactive polyamide composition. 5,180,802, Cl. 528-335.000.

Hartmann, Heinrich: *See*—
Niessner, Manfred; Beck, Juergen; Hartmann, Heinrich; Kemna, Andreas H.; and Wickel, Stefan, 5,180,804, Cl. 528-500.000.

Haruta, Kenyu: *See*—
Sato, Yukio; Suzuki, Akihiro; Inoue, Mitsuo; Haruta, Kenyu; and Nagai, Haruhiko, 5,181,217, Cl. 372-38.000.

Hasbro, Inc.: *See*—
Eddins, Fred D.; and Patterson, Maureen, 5,180,325, Cl. 446-385.000.

Hasegawa, Kazumi: *See*—
Hibino, Hiromi; Hasegawa, Kazumi; Nishida, Koujiro; Abe, Kouzou; and Kurihara, Toshio, 5,180,238, Cl. 400-247.000.

Hashiguchi, Ryoji, to Ando Electric Co., Ltd. PROM writer having check sum function. 5,181,206, Cl. 371-21.500.

Hashimoto, Matsuo: *See*—
Yoda, Sumio; Futamura, Nobuyuki; Hashimoto, Matsuo; and Saiki, Yoshifumi, 5,180,794, Cl. 525-487.000.

Hashimoto, Takahiro: *See*—
Hama, Mamoru; Mitsuyoshi, Matao; and Hashimoto, Takahiro, 5,179,943, Cl. 128-368.000.

Hashimoto, Toshimasa: *See*—
Takaku, Akira; Hashimoto, Toshimasa; Suzuki, Toshio; Takahashi, Yutaka; and Saito, Kazuo, 5,180,529, Cl. 264-29.600.

Haskin, Helen K.: *See*—
Nolte, David G.; Haskin, Helen K.; and Colling, Edwin L., Jr., 5,180,556, Cl. 422-109.000.

Haspel, Martin V.: *See*—
Hanna, Michael, Jr.; Haspel, Martin V.; and Hoover, Herbert C., Jr., 5,180,814, Cl. 530-388.800.

Hata, Hamako: *See*—
Sato, Toshiya; and Hata, Hamako, 5,180,586, Cl. 424-405.000.

Hata, Kazuyuki: *See*—
Hayama, Kazuhide; Hata, Kazuyuki; Yamada, Katsuhiko; Abe, Keizo; and Ozu, Takahiro, 5,180,766, Cl. 524-315.000.

Hatabu, Shoji: *See*—
Ueno, Hiroshi; Hatabu, Shoji; Kumata, Etsuko; and Adachi, Takehiro, 5,180,231, Cl. 384-527.000.

Hatakeyama, Hidetoshi: *See*—
Sugihara, Yasuo; Komatsu, Toshio; Kashiba, Takashi; Hatakeyama, Hidetoshi; and Takeuchi, Teruo, 5,180,518, Cl. 252-188.280.

Hatakoshi, Genichi: *See*—
Ishikawa, Masayuki; Okuda, Hajime; Shiozawa, Hideo; Itaya, Kazuhiko; Watanabe, Yukio; Suzuki, Mariko; and Hatakoshi, Genichi, 5,181,218, Cl. 372-45.000.

Hathiram, Daraius: *See*—
Gibby, Gordon L.; Lampotang, Samsun; Hathiram, Daraius; and Gravenstein, Nikolaus, 5,180,896, Cl. 219-10.55A.

Hattori, Hisao: *See*—
Harada, Keizo; Hattori, Hisao; and Itozaki, Hideo, 5,180,708, Cl. 505-1.000.

Hattori, Isamu: *See*—
Era, Susumu; Matsumoto, Toshio; Kobayashi, Yoshinori; Shitara, Masashi; Hattori, Isamu; and Nomura, Yoshihiro, 5,180,786, Cl. 525-281.000.

Hattori, Masashi: *See*—
Sakakibara, Shiro; Inuzuka, Takeshi; Hattori, Masashi; Fukatsu, Hironari; and Takaki, Shinichi, 5,179,867, Cl. 74-335.000.

Hattori, Shizuo: *See*—
Gomi, Hideyuki; Hozumi, Tatsunobu; Hattori, Shizuo; Tagawa, Chiaki; Kishimoto, Fumitaka; and Bjorck, Lars, 5,180,810, Cl. 530-350.000.

Hauber, Peter. Camper shell latch with inside safety release. 5,180,201, Cl. 292-336.300.

Hauck, Lane T.: *See*—
Marshall, Roger N.; Hauck, Lane T.; Shapiro, Leonid; Busch, Jeffrey W.; and Stevens, Eric S., 5,181,015, Cl. 340-706.000.

Haugen, Ronald E.; and Murphy, David T., to Vix Design Products, Inc. Wheel handling apparatus. 5,180,274, Cl. 414-427.000.

Haupt, Jens; Haupt, Kirstin; and Hornhauer, Henry, to Jenoptik GmbH. Circuit arrangement for optimal current generation in processes of electrochemically initiated plasma-chemical layer production. 5,181,154, Cl. 361-17.000.

Haupt, Kirstin: *See*—
Haupt, Jens; Haupt, Kirstin; and Hornhauer, Henry, 5,181,154, Cl. 361-17.000.

Havens, Marvin R., to W.R. Grace & Co.-Conn. Metallized bag for static protection of electronic components. 5,180,615, Cl. 428-35.300.

Havey, Gary D.: *See*—
Ferguson, Dennis D.; and Havey, Gary D., 5,181,025, Cl. 340-870.210.

Haworth, James R. Trailer hitch alignment device. 5,180,182, Cl. 280-477.000.

Hayakawa, Atsuya, to Brother Kogyo Kabushiki Kaisha. Embroidery data preparing apparatus. 5,181,176, Cl. 364-470.000.

Hayakawa, Yuichi; Iwakura, Takeshige; Tsutsui, Hiroshi; Hirano, Atsushi; and Miyazaki, Makoto, to NEC Corp. Dual magnetic head for reading and writing information at high and low track density including erase gaps having an undulating shape. 5,181,150, Cl. 360-121.000.

Hayama, Kazuhide; Hata, Kazuyuki; Yamada, Katsuhiko; Abe, Keizo; and Ozu, Takahiro, to Mitsubishi Petrochemical Co., Ltd. Resin composition for primer use and primer composition employing the same. 5,180,766, Cl. 524-315.000.

Hayashi, Isamu; and Kondoh, Harufusa, to Mitsubishi Denki Kabushiki Kaisha. Temperature-compensated ring oscillator circuit formed on a semiconductor substrate. 5,180,995, Cl. 331-57.000.

Hayashi, Kazuya: *See*—
Kubota, Koichi; Katoh, Tetsuya; Hirata, Masayuki; and Hayashi, Kazuya, 5,180,402, Cl. 8-490.000.

Hayashi, Mineo: *See*—
Kikumoto, Nobuo; and Hayashi, Mineo, 5,180,422, Cl. 75-644.000.

Hayashizaki, Yoshikatsu: *See*—
Yanagida, Katsuro; and Hayashizaki, Yoshikatsu, 5,180,094, Cl. 228-4.500.

Haydon, Frank A. Method and device for attaching artificial joint implants to the ends of bones. 5,180,383, Cl. 606-72.000.

Hayward, Robert D.: *See*—
Down, William J.; and Hayward, Robert D., 5,179,877, Cl. 81-443.000.

Head, David F.: *See*—
Baer, Thomas M.; and Head, David F., 5,181,223, Cl. 372-69.000.

Health Research, Inc.: *See*—
Sufrin, Janice R.; Bacchi, Cyrus J.; Porter, Carl W.; Nathan, Henry; Spiess, Arthur J.; and Yarlett, Nigel, 5,180,714, Cl. 514-46.000.

Hebels, Albert, to Pagendarm GmbH. Apparatus for drying a moisture-containing layer at one side of a running substrate. 5,179,908, Cl. 118-68.000.

Hebert, Debra M.: *See*—
Hebert, Neil H.; and Hebert, Debra M., 5,179,745, Cl. 5-620.000.

Hebert, Neil H.; and Hebert, Debra M. Elevating convertible wheelchair. 5,179,745, Cl. 5-620.000.

Hebsgaard, Jens O., to A/S Chr. Fabers Fabriker. Apparatus for assembling slats of venetian blinds. 5,179,771, Cl. 29-24.500.

Hedberg, Earl D.: *See*—
Oleksinski, John A.; and Hedberg, Earl D., 5,181,069, Cl. 355-133.000.

Hedley, David J.; and Dorricott, Martin R., to Sony Broadcast & Communications Limited. Video signal processing apparatus and method. 5,181,111, Cl. 358-140.000.

Hedner, Ulla K. E. Method for the treatment of bleeding disorders. 5,180,583, Cl. 424-94.640.

Heidel, Jeffrey C.: *See*—
Swartz, Harold L.; Stansberry, Warren W.; Heidel, Jeffrey C.; and Carlson, Bradley D., 5,180,986, Cl. 324-660.000.

Heidel, Klaus; Krause, Frank; and Hofmann, Peter, to Starchem GmbH. Process for the preparation of finely divided, water-swellable polysaccharide graft polymers. 5,180,800, Cl. 527-300.000.

Heidelberg Harris GmbH: *See*—
Belanger, Roger R.; Mack, Richard B.; and Novick, Michael A., 5,180,160, Cl. 271-315.000.

Heier, Manfred; Brudermann, Uwe; and Kipfelsberger, Christian, to RXS Schrumpftechnik-Garnituren GmbH. Heat-shrinkable envelope having a tear-resistant reinforcing component. 5,180,621, Cl. 428-138.000.

Heilman, William J.; and Venier, Clifford G., to Pennzoil Products Company. Base oil for shear stable multi-viscosity lubricants and lubricants therefrom. 5,180,865, Cl. 585-10.000.

Heinemann, Michael; Soeder, Bernhard; and Meier, Wolfgang, to Roehm GmbH Chemische Fabrik. Plasma generator with secondary radiator. 5,180,948, Cl. 315-111.210.

Heinz, Dirk: *See*—
Grutter, Markus G.; Heinz, Dirk; and Liersch, Manfred, 5,180,667, Cl. 435-69.200.

Heiss, James D.: *See*—
Ferguson, John H., Sr.; and Heiss, James D., 5,179,769, Cl. 28-292.000.

Helena Laboratories Corporation: *See*—
Sarrine, Robert J., 5,179,960, Cl. 128-764.000.

Helit, Thomas M.; Lowell, Kenneth W.; and Synnett, Karen P., to Pitney Bowes Inc. Self contained transport apparatus with drawer mount. 5,180,157, Cl. 271-256.000.

Hellyer, Richard A.; Wagner, James R.; Pees, James M.; and Lohmann, Detlef, to General Motors Corporation. Air spring module for a damper. 5,180,144, Cl. 267-64.190.

Helm, Birgit A.: *See*—
Gould, Hannah J.; and Helm, Birgit A., 5,180,805, Cl. 530-324.000.

Helmlinger, Daniel: *See*—
Etzweiler, Franz; Helmlinger, Daniel; Nussbaumer, Cornelius; and Pesaro, Mario, 5,180,709, Cl. 512-17.000.

Helmstetter, Richard C.: *See*—
Schmidt, Glenn H.; Sheehan, John P.; and Helmstetter, Richard C., 5,180,166, Cl. 273-167.00F.
Hemmeter, Richard W.: *See*—
Dowden, Douglas C.; Hemmeter, Richard W.; Herr, Diane E.; McCormick, William K.; Petrelli, Robert; Piereth, Richard J.; Salchenberger, Samuel M.; Sehgal, Chander S.; and Verma, Mahendra K., 5,181,237, Cl. 379-88.000.
Hendrickson, James B.: *See*—
Obermayer, Arthur S.; Hendrickson, James B.; and Hussoin, Sajjat, 5,180,821, Cl. 540-465.000.
Hendrickson, Ruth A., to Brooks Automation, Inc. Articulated arm transfer device. 5,180,276, Cl. 414-752.000.
Hendry, Robert: *See*—
Markunas, Robert J.; Hendry, Robert; and Rudder, Ronald A., 5,180,435, Cl. 118-723.000.
Henke, Jurgen; Spinner, Erwin; and Fruh, Peter, to Mercedes-Benz AG. Injection-type combustion engine with electric spark ignition and a heating system. 5,179,927, Cl. 123-549.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Fleckenstein, Theo; Goebel, Gerd; Carduck, Franz-Josef; Demmering, Guenther; and Kubersky, Hans-Peter, 5,180,858, Cl. 568-885.000.
Hennings, David R.: *See*—
Vassiliadis, Arthur; Shaffer, Joseph W.; Fullmer, David J.; Brewer, Michael H.; Hennings, David R.; and Myers, Terry D., 5,180,304, Cl. 433-224.000.
Henseler, Wolfgang: *See*—
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Morand, Peter; Arnason, John T.; Philogene, Bernard J. R.; MacEachern, Anita M.; Leitch, Leonard C.; and Kaminski, Jerzy, 5,180,838, Cl. 549-59.000.
Herbert, William S. Lost personal accessory item identification and return method and articles. 5,180,192, Cl. 283-101.000.
Herin, Marc: *See*—
Husa, Robert K.; Hallinan, E. Ann; Lesne, Michel; and Herin, Marc, 5,180,720, Cl. 514-211.000.
Hernandez, Maria A.: *See*—
Powers, James C.; May, Sheldon W.; Hernandez, Maria A.; Thornton, Steve; and Glinski, Jan, 5,180,831, Cl. 546-291.000.
Hernandez-Solis, Maria: *See*—
Marvin, Dennis F.; and Hernandez-Solis, Maria, 5,180,942, Cl. 310-346.000.
Herr, Diane E.: *See*—
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Herschlag, Daniel: *See*—
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Hewlett-Packard Company: *See*—
Harti, Hans-georg, 5,180,293, Cl. 417-366.000.
Hubby, Laurence M., Jr., 5,181,130, Cl. 359-42.000.
Montijo, B. Allen, 5,180,971, Cl. 324-121.00R.
Rose, Donald J., Jr., 5,180,479, Cl. 204-299.00R.
Sheats, James R., 5,180,655, Cl. 430-327.000.
Shields, James P.; and Adamic, Raymond J., 5,181,045, Cl. 346-1.100.
Young, James E.; McManigill, Douglass; and Lux, Jurgen A., 5,180,475, Cl. 204-180.100.
Heywang, Ulrich; Casutt, Michael; and Schwarz, Michael, to Merck Patent Gesellschaft mit beschraenkter Haftung. Pilosinine derivatives. 5,180,837, Cl. 548-315.400.
Hi-Shear Corporation: *See*—
Wiese, David, 5,180,265, Cl. 411-150.000.
Hibino, Hiromi; Hasegawa, Kazumi; Nishida, Koujiro; Abe, Kouzou; and Kurihara, Toshio, to Citizen Watch Co., Ltd. Dot impact printer. 5,180,238, Cl. 400-247.000.
Hickey, William L.; and Boers, Arie, to Bayport Controls, Inc. Surveillance camera system. 5,181,120, Cl. 358-229.000.
Hicks, Bradford W.; Blust, Brian R.; Beverly, James A.; and Schultz, Gary R., to Eaton Corporation. Fault detection method for central tire inflation system. 5,179,981, Cl. 141-4.000.
Hidalgo, Martiniano A. Ladder stabilizer apparatus. 5,180,032, Cl. 182-214.000.
Higashimoto, Noboru: *See*—
Tsurutani, Kazushi; Hosogai, Daijiro; Kokubo, Kakuro; Kobayashi, Taiji; Higashimoto, Noboru; Endoh, Masami; Namiyama, Kazuyoshi; and Yoneda, Makoto, 5,179,923, Cl. 123-435.000.
Higgins, Charles M., Jr.: *See*—
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HighTech Receptor AB: *See*—
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Hightons Arganisation Limited: *See*—
Higton, Peter A., 5,179,802, Cl. 49-74.000.
Hightower, Greg A. Binding system. 5,180,246, Cl. 402-20.000.
Higley, David P., to Du Pont de Nemours, E. I., and Company. Thermally stable, fluorine-containing organsilanes. 5,180,845, Cl. 556-445.000.
Higton, Peter A., to Hightons Arganisation Limited. Louvre structures. 5,179,802, Cl. 49-74.000.
Higuchi, Noriko: *See*—
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Higuchi, Yasushi: *See*—
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Hijikata, Masayuki: *See*—
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Hikasa, Tadashi; Ibuki, Koichiro; Hamanaka, Tatsuo; and Mizumori, Motoo, to Sumitomo Chemical Company Limited. Process for producing a thermoplastic elastomer composition. 5,180,769, Cl. 524-525.000.
Hill, Guy C., to Flourlock (UK) Limited. Flooring product. 5,179,812, Cl. 52-589.000.
Hill, Harlan F.: *See*—
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Hill-Rom Company, Inc.: *See*—
Foster, L. Dale; and Breidenbach, James H., 5,179,744, Cl. 5-600.000.
Hill, Samuel B., Jr. Back scrubber mat. 5,179,755, Cl. 15-160.000.
Hillen, Heinz: *See*—
Doerper, Thomas; Moeller, Achim; Hillen, Heinz; Keilhauer, Gerhard; Emling, Franz; and Daum, Lothar, 5,180,811, Cl. 530-351.000.
Hillestad, Jerome. Demountable tomato plant support. 5,179,799, Cl. 47-45.000.
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LaVallee, James R.; Hilsenbeck, Jerry M.; Brown, James G.; Sumner, Roger A.; Zazzera, Andre C.; and Bailey, Dana A., 5,181,236, Cl. 379-67.000.
Himmler, Ronald: *See*—
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Himont Incorporated: *See*—
Cookson, Gleason O.; Dang, Vu A.; and Raman, Krishna, 5,180,830, Cl. 546-222.000.
Hindall, Carey B. Picture hanger locating device. 5,180,135, Cl. 248-544.000.
Hines, Ronald N.: *See*—
States, J. Christopher; Hines, Ronald N.; and Novak, Raymond F., 5,180,666, Cl. 435-29.000.
Hingorani, Kishan G.: *See*—
O'Hara, Gary J.; Phillips, David B.; and Hingorani, Kishan G., 5,179,936, Cl. 128-9.000.
Hinrichs, Erhard W.: *See*—
Morgan, Jerry L.; Frisch, Alan M.; and Hinrichs, Erhard W., 5,181,250, Cl. 381-51.000.
Hinson, Charles; and LaCrosse, Gaylen, to Envirozone Technologies, Inc. Process for removal of solid, chemical and bacterial waste from water. 5,180,499, Cl. 210-706.000.
Hinz, Joachim; Schneid, Josef; Steidele, Andreas; Volz, Karl; and Stotz, Wolf-Gunter, to Sulzer Escher Wyss GmbH. Calender with positionable rollers. 5,179,894, Cl. 100-163.00A.
Hirahata, Shigeru: *See*—
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Hirai, Mutsumi; Ishimoto, Shinji; and Ito, Kenichi, to Nippon Nuclear Fuel Development Co., Ltd. Nuclear fuel pellets. 5,180,527, Cl. 252-638.000.
Hiramatsu, Kenichi, to Kabushiki Kaisha Toshiba. IC card with individual authentication function. 5,180,901, Cl. 235-380.000.
Hiramatsu, Tamihei, to Sony Corporation. Learning apparatus. 5,180,307, Cl. 434-157.000.
Hiramatsu, Yasushi; Ishiuchi, Yukio; and Nagashima, Hiromitsu, to Mitsubishi Gas Chemical Company, Inc. Method for producing hydrogen peroxide. 5,180,573, Cl. 423-584.000.
Hirano, Atsushi: *See*—
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Hirano, Tetsuji: *See*—
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Hirasaki, Norio: *See*—
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Hirata, Isao: *See*—
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Hirata, Masayuki: *See*—
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Hirata, Shinji; and Tanaka, Kazuo, to West Electric Co., Ltd. Strobo device. 5,180,953, Cl. 315-241.00S.
Hirate, Kenji: *See*—
Isowa, Yoshikazu; Sato, Yoshiaki; Nakashima, Yoshiharu; Masaki, Mitsuo; Miyake, Norihisa; Uehara, Masaki; and Hirate, Kenji, 5,180,712, Cl. 514-16.000.
Hirohara, Naoya: *See*—
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Hirose Electric Co., Ltd.: *See*—
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Hirose, Kazunori, to Terumo Kabushiki Kaisha. Viscous liquid applicator. 5,180,244, Cl. 401-264.000.

Hirose, Shoji: *See*—
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Hirose, Yutaka; Yamanaka, Yutaka; and Okanoue, Kazuhiro, to NEC Corporation. Signal reproducing apparatus for optical recording and reproducing equipment with compensation of crosstalk from nearby tracks and method for the same. 5,181,161, Cl. 369-48.000.

Hirota, Katsuaki; Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; and Kato, Fumiaki, to Sony Corporation. Auto-focus system for video camera. 5,181,119, Cl. 358-227.000.

Hirscher, Hans: *See*—
Wagner, Rudolf; and Hirscher, Hans, 5,180,000, Cl. 165-80.100.

Hiser, Timothy D. Saddle slicker. 5,179,821, Cl. 54-44.100.

Hitachi Automotive Engineering Co., Ltd.: *See*—
Ueta, Koki; Kamada, Naoki; Mori, Hideo; Endo, Suehiro; and Tajima, Susumu, 5,179,864, Cl. 74-7.00A.

Hitachi Chemical Company, Ltd.: *See*—
Era, Susumu; Matsumoto, Toshio; Kobayashi, Yoshinori; Shitara, Masashi; Hattori, Isamu; and Nomura, Yoshihiro, 5,180,786, Cl. 525-281.000.

Hitachi Construction Machinery Company, Ltd.: *See*—
Arima, Yukio; Yanagimoto, Hiroaki; Kunitomo, Yuichi; and Tominaga, Tetsuyoshi, 5,179,954, Cl. 128-660.070.

Hitachi, Ltd.: *See*—
Chiba, Katsuyoshi; Katsumoto, Masayuki; Uesaka, Yasutaro; Fukke, Hajime; Ishihara, Heigo; Matsuyama, Iwao; Kodama, Naoki; Inoue, Hitoshi; and Terada, Yoshiharu, 5,180,608, Cl. 427-560.000.

Fukke, Hajime; Akagi, Motoo; Matsuyama, Iwao; Katsumoto, Masayuki; Inoue, Hitoshi; Kodama, Naoki; and Uesaka, Yasutaro, 5,180,616, Cl. 428-64.000.

Katohno, Nobuo; and Shibata, Yoshihiro, 5,180,117, Cl. 242-189.000.

Katsumata, Kenji; Hirahata, Shigeru; Sugiyama, Masato; Matono, Takaaki; Ishikura, Kazuo; Suzuki, Sunao; and Kaizaki, Kazuhiro, 5,181,110, Cl. 358-140.000.

Katsumata, Masao; Momata, Kazuhiro; Adachi, Kazuyoshi; Takeura, Tooru; Kitada, Masahiro; Kamo, Yoshihisa; and Yoshimatsu, Toshikane, 5,181,149, Cl. 360-119.000.

Kurosu, Yasuo; Yokoyama, Yoshihiro; Nishikawa, Kenichi; Masuzaki, Hidefumi; and Fujinawa, Masaaki, 5,181,260, Cl. 382-46.000.

Manaka, Toshio, 5,179,924, Cl. 123-682.000.

Motoki, Yuko; Honda, Akinori; and Morita, Takashi, 5,181,199, Cl. 370-60.000.

Nakagaki, Nobufumi; Kurita, Toshiyuki; Murata, Toshinori; Kaizaki, Kazuhiro; Kubota, Sadao; Kamiya, Masanori; Sekiya, Hiroshi; and Fujiwara, Kenichi, 5,181,116, Cl. 358-159.000.

Nakajima, Hiroyuki; and Kaji, Hiroyuki, 5,181,163, Cl. 364-419.000.

Ogata, Masatsugu; Sugawara, Yasuhide; Segawa, Masanori; Abe, Hidetoshi; and Horie, Osamu, 5,181,097, Cl. 257-788.000.

Okada, Ryoji; Sato, Motohiro; Yamada, Toshihiro; and Kuwabara, Heikichi, 5,180,001, Cl. 165-80.400.

Sato, Kunio; Akimaru, Susumu; Hoshi, Nobuyoshi; and Hori, Yasuro, 5,181,129, Cl. 358-494.000.

Ueta, Koki; Kamada, Naoki; Mori, Hideo; Endo, Suehiro; and Tajima, Susumu, 5,179,864, Cl. 74-7.00A.

Usagawa, Toshiyuki; Imamura, Yoshinori; Okuhira, Hidekazu; Goto, Shigeo; Kobayashi, Masayoshi; and Takatani, Shinichiro, 5,181,087, Cl. 257-194.000.

Hitachi Maxell, Ltd.: *See*—
Kinoshita, Shinitsu, 5,180,595, Cl. 425-556.000.

Hitachi Metals, Ltd.: *See*—
Inoue, Ryoji, 5,180,696, Cl. 501-87.000.

Hitachi Video Engineering Inc.: *See*—
Katsumata, Kenji; Hirahata, Shigeru; Sugiyama, Masato; Matono, Takaaki; Ishikura, Kazuo; Suzuki, Sunao; and Kaizaki, Kazuhiro, 5,181,110, Cl. 358-140.000.

Nakagaki, Nobufumi; Kurita, Toshiyuki; Murata, Toshinori; Kaizaki, Kazuhiro; Kubota, Sadao; Kamiya, Masanori; Sekiya, Hiroshi; and Fujiwara, Kenichi, 5,181,116, Cl. 358-159.000.

Hitec Co., Ltd.: *See*—
Kasai, Minoru; and Nakamura, Minoru, 5,180,327, Cl. 452-47.000.

Hludzinski, Stanley J.: *See*—
Chen, Harold; Anglin, Noah L.; and Hludzinski, Stanley J., 5,180,905, Cl. 235-483.000.

Ho, Chang D., to Goldstar Co., Ltd. Method of storing and editing data in a television system and apparatus therefor. 5,181,113, Cl. 358-142.000.

Ho, W. S. Winston: *See*—
Sartori, Guido; Ho, W. S. Winston; and Noone, Robert E., 5,180,496, Cl. 210-654.000.

Hoang, Minh Q.: *See*—
Khan, Mohammad A.; and Hoang, Minh Q., 5,180,061, Cl. 206-570.000.

Hockh, Jurgen; and Koppelhuber, Franz, to Hockh Metall-Reinigungsanlagen GmbH. Cleaning and drying system. 5,180,438, Cl. 134-21.000.

Hockh Metall-Reinigungsanlagen GmbH: *See*—
Hockh, Jurgen; and Koppelhuber, Franz, 5,180,438, Cl. 134-21.000.

Hodgen, Gary D., to Applied Research Systems ARS Holding N.V. Combined treatment with GnRH antagonist and GnRH to control gonadotropin levels in mammals. 5,180,711, Cl. 514-15.000.

Hodgson, David O., to Sony Corporation of America. Digital video processing system with mixing prefilter. 5,181,100, Cl. 358-37.000.

Hoechst Aktiengesellschaft: *See*—
Crause, Peter; Habermann, Paul; and Tripier, Dominique, 5,180,668, Cl. 435-69.200.
Staffel, Thomas; and Adrian, Renate, 5,180,566, Cl. 423-238.000.

Hoechst Celanese Corporation: *See*—
Vigneault, Richard E.; Wagner, William S.; Weisskopf, Klaus; Williamson, R. Edward; and Woodward, A. John, 5,180,793, Cl. 525-446.000.

Hoechst-Roussel Pharmaceuticals Incorporated: *See*—
Wettlaufer, David G.; Shutske, Gregory M.; and Nemoto, Peter A., 5,180,834, Cl. 548-241.000.

Hoesch Maschinenfabrik Deutschland AG: *See*—
Orth, Heinz-Dietmar, 5,180,095, Cl. 228-17.700.

Hoffman, Kevin: *See*—
DiDio, Gary M.; Jones, Kermit; Hoffman, Kevin; Laarman, Timothy; Call, Jon; and Nath, Prem, 5,180,434, Cl. 118-718.000.

Hofmann, Peter: *See*—
Heidel, Klaus; Krause, Frank; and Hofmann, Peter, 5,180,800, Cl. 527-300.000.

Hofmann, Ralf: *See*—
Steiner, Gerd; Weniger, Rudi; Braun, Rolf; Otterbach, Rainer; Schubert, Erhard; and Hofmann, Ralf, 5,181,257, Cl. 382-17.000.

Hofmeister, Peter: *See*—
Leyendecker, Joachim; Neubauer, Hans-Juergen; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; and Krieg, Wolfgang, 5,180,727, Cl. 514-255.000.

Hoher, Peter: *See*—
Hagenauer, Joachim; and Hoher, Peter, 5,181,209, Cl. 371-43.000.

Hokazono, Yuichi; and Konomi, Toshiaki, to Toyota Jidosha Kabushiki Kaisha. Intake air control device for an internal combustion engine. 5,179,917, Cl. 123-52.0MF.

Holderness, Stewart G., to British Nuclear Fuels, plc. Cleaning of solutions of alkylphosphates. 5,180,526, Cl. 252-631.000.

Holl, Timothy, to Bose Corporation. Sound image enhancing. 5,181,247, Cl. 381-24.000.

Holloway, Jordan M.: *See*—
Pursley, John A.; Holloway, Jordan M.; and Wakefield, Thomas L., 5,180,380, Cl. 606-54.000.

Holmes, Charles, to Canada, Her Majesty the Queen in right of Canada, as represented by The National Research Council of. Method for quantitatively assaying the presence of diarrhetic shellfish poisoning toxins in marine samples. 5,180,665, Cl. 435-21.000.

Holtermann, Henri, to Laboratoires Biotrol. Ostomy appliance. 5,180,377, Cl. 604-342.000.

Holzmann, Roland: *See*—
Bernhardt, Wolfgang; Holzmann, Roland; Schmidt, Guenther; Kirstein, Lothar; and Wetzel, Gerhard, 5,180,215, Cl. 303-113.200.

Honbo, Yoichi; Yoshizaki, Satoshi; and Iwasaki, Motohiro, to Bridgestone Corporation. Pneumatic radial tires for construction vehicles. 5,180,457, Cl. 152-541.000.

Honda, Akinori: *See*—
Motoki, Yuko; Honda, Akinori; and Morita, Takashi, 5,181,199, Cl. 370-60.000.

Honda Giken Kogyo K.K. (Honda Motor Co., Ltd, in English): *See*—
Miyashita, Yukio; Ohno, Hiroshi; Noguchi, Kunio; and Fukuchi, Hironao, 5,179,929, Cl. 123-688.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Komatsu, Satoru, 5,181,037, Cl. 342-70.000.
Kuroda, Shigetaka; and Iwata, Yoichi, 5,179,833, Cl. 60-276.000.
Matsuda, Shohei; and Yahagi, Toshio, 5,181,174, Cl. 364-426.020.
Shiomi, Kazuyuki; Tanaka, Mitsuharu; Kiku, Kazuomi; and Saito, Akihisa, 5,180,319, Cl. 440-52.000.
Shiraishi, Shuji; and Yamamoto, Osamu, 5,181,175, Cl. 364-426.030.
Tsuboi, Kiyoshi, 5,179,860, Cl. 73-579.000.

Honda, Hiroaki: *See*—
Iwayama, Kazuyoshi; and Honda, Hiroaki, 5,180,862, Cl. 570-202.000.

Honda, Mutsumi: *See*—
Chazono, Hirokazu; Honda, Mutsumi; Kisi, Hirosi; Saito, Hirosi; and Shizuno, Hisamitsu, 5,181,157, Cl. 361-321.000.

Honda, Toshiharu. Centrifugal pump. 5,180,280, Cl. 415-206.000.

Honeywell Inc.: *See*—
Frazzini, Ronald M.; and Solosky, Rick M., 5,180,979, Cl. 324-207.180.
Krzyzanowski, Robert V., 5,180,933, Cl. 307-514.000.
Ohnstein, Thomas R., 5,180,623, Cl. 428-209.000.
Postma, Stephen J.; Gesin, Milford M.; Demma, Nick A.; Bjork, Paul E.; and Wagener, Thomas J., 5,180,978, Cl. 324-207.160.
Ross, Gordon F., 5,180,970, Cl. 324-117.00H.

Hoogendijk, Gerardus N. A., to U.S. Philips Corporation. Self-calibrating CRT measuring instrument. 5,180,973, Cl. 324-130.000.

Hooker, Ira D., Jr.: *See*—
Pearce, Ronald A.; and Hooker, Ira D., Jr., 5,180,277, Cl. 414-792.700.

Hoover, Herbert C., Jr.: *See*—
Hanna, Michael, Jr.; Haspel, Martin V.; and Hoover, Herbert C., Jr., 5,180,814, Cl. 530-388.800.

Hopf, Reinhard: *See*—
Eidenschink, Rudolf; Hopf, Reinhard; and Poetsch, Eike, 5,180,521, Cl. 252-299.610.

Hopper, Scott R., to Augat Communications Group Inc. Fiber optic cable entry connector. 5,181,272, Cl. 385-139.000.
Hori, Yasuro: *See*—
Sato, Kunio; Akimaru, Susumu; Hoshi, Nobuyoshi; and Hori, Yasuro, 5,181,129, Cl. 358-494.000.
Horide, Fumio: *See*—
Katayama, Yasuyuki; Ishimoto, Yasuhiko; Horide, Fumio; Tsuda, Shigenori; and Nishioka, Fumio, 5,180,420, Cl. 504-116.000.
Horie, Hirofumi: *See*—
Sugaya, Yoshio; Terada, Ichiro; Sanekata, Kiyonari; and Horie, Hirofumi, 5,180,750, Cl. 521-32.000.
Horie, Kiyoshi, to Kabushiki Kaisha CSK. Writing device for optical memory card. 5,181,194, Cl. 369-44.250.
Horie, Osamu: *See*—
Ogata, Masatsugu; Sugawara, Yasuhide; Segawa, Masanori; Abe, Hidetoshi; and Horie, Osamu, 5,181,097, Cl. 257-788.000.
Horigome, Naoyuki: *See*—
Sukeyasu, Ryuzo; Kishina, Yoshiyuki; Okawa, Masao; Horigome, Naoyuki; and Ito, Yasuhito, 5,179,819, Cl. 53-442.000.
Hornburg, Wynn E.; and Beumer, John, III, to University of California, Regents of the, by said John Beumer, III. Retrievable dental prothesis apparatus and method of fabrication. 5,180,303, Cl. 433-173.000.
Hornhauer, Henry: *See*—
Haupt, Jens; Haupt, Kirstin; and Hornhauer, Henry, 5,181,154, Cl. 361-17.000.
Hoshi, Nobuyoshi: *See*—
Sato, Kunio; Akimaru, Susumu; Hoshi, Nobuyoshi; and Hori, Yasuro, 5,181,129, Cl. 358-494.000.
Hosogai, Daijiro: *See*—
Tsurutani, Kazushi; Hosogai, Daijiro; Kokubo, Kakuro; Kobayashi, Taiji; Higashimoto, Noboru; Endoh, Masami; Namiyama, Kazuyoshi; and Yoneda, Makoto, 5,179,923, Cl. 123-435.000.
Hosokawa Micron Australia Pty. Ltd.: *See*—
Brame, Warren L., 5,180,110, Cl. 239-566.000.
Hosoya, Ikuo; and Yoneyama, Yasuhiro, to Idemitsu Petrochemical Company Limited. Process for the preparation of diamond. 5,180,571, Cl. 423-446.000.
Hosafield, Robin C.; and Adamski, Joseph R., to Raytheon Company. Adaptive autopilot. 5,179,905, Cl. 114-144.00E.
Hovis, James E.; and Finke, Harry P., to Bloom Engineering Company, Inc. Low NOx regenerative burner. 5,180,300, Cl. 431-115.000.
Howa Machinery, Ltd.: *See*—
Yasuda, Hironori; Yamamoto, Katumoto; and Yoshida, Osamu, 5,179,826, Cl. 57-104.000.
Howard, William G.: *See*—
Weiss, Douglas J.; Cretzmeyer, John W.; Crespi, Ann M.; Howard, William G.; and Skarstad, Paul M., 5,180,642, Cl. 429-90.000.
Howell, Chesley R., to Schlumberger Canada Limited. Securing mechanism for an electricity metering device. 5,181,166, Cl. 361-364.000.
Howlett, Eric F.: *See*—
Pearson, Scott A.; Oh, Jin; Lethin, Richard A.; and Howlett, Eric F., 5,180,132, Cl. 248-362.000.
Hoya Corporation: *See*—
Sato, Koji; Suzuki, Tokio; Kamiya, Hajime; Nakamura, Kimio; Kosaka, Masahisa; and Ohsora, Tetsuo, 5,181,141, Cl. 359-580.000.
Hoya Corporation USA: *See*—
Huff, Richard E., 5,180,977, Cl. 324-158.00P.
Hoyano, Yuhei; and Sato, Masahiko, to Juki Corporation. Cycle sewing machine. 5,179,904, Cl. 112-67.000.
Hoyle, David S. Drive arm for a spreader. 5,180,112, Cl. 239-685.000.
Hozumi, Tatsunobu: *See*—
Gomi, Hideyuki; Hozumi, Tatsunobu; Hattori, Shizuo; Tagawa, Chiaki; Kishimoto, Fumitaka; and Bjorck, Lars, 5,180,810, Cl. 530-350.000.
Hsieh, Paonan; McComis, William T.; Senapati, Nagabhusan; Stulen, Foster B.; and Paul, Darrell D., to Gas Research Institute. Method for deep-fat frying food products. 5,180,600, Cl. 426-233.000.
HSST Corporation: *See*—
Shuto, Masamoto, 5,180,041, Cl. 191-53.000.
Hsu, Hui-Pin; and Chesler, Ronald B., to Hughes Aircraft Company. Optical fiber canister. 5,181,270, Cl. 385-134.000.
Hsung, Jean-Cheui: *See*—
Van Hofwegen, Lloyd; Hsung, Jean-Cheui; and Huntwork, Daniel, 5,179,945, Cl. 128-419.00D.
Hu, James, to Pro Eton Corporation. Expandable disc holder assembly. 5,180,058, Cl. 206-309.000.
Huang, Barney K. Self-watering air-producing plant tray system. 5,179,800, Cl. 47-73.000.
Huang, Roger M. C., to Bestek Electronics Corp. Pressure gauge. 5,179,856, Cl. 73-4.00R.
Huang, Xianrui; and Eyssa, Yehia M., to Wisconsin Alumni Research Foundation. High efficiency DC/DC current source converter. 5,181,170, Cl. 363-21.000.
Hubby, Laurence M., Jr., to Hewlett-Packard Company. Fiber optic faceplate liquid crystal display. 5,181,130, Cl. 359-42.000.
Hubner, Oskar; and Stauner, Rudolf, to Sulzer Brothers Limited. Weft yarn brake with logic circuit control. 5,179,980, Cl. 139-450.000.
Huels Aktiengesellschaft: *See*—
Stehr, Michael; and Voges, Heinz-Werner, 5,180,856, Cl. 568-617.000.
Huff, Richard E., to Hoya Corporation USA. Membrane probe contact bump compliancy system. 5,180,977, Cl. 324-158.00P.
Hufschmid, Markus D.: *See*—
Neeser, Fredy D.; Hufschmid, Markus D.; and Ruprecht, Jurg P., 5,181,225, Cl. 375-1.000.
Hug, Gottfried, to Erwin Sick GmbH Optik-Elektronik. Distance measuring apparatus with phase detection. 5,180,922, Cl. 250-561.000.
Hughes Aircraft Company: *See*—
Bak, Chan S.; Miller, Leroy J.; and Van Ast, Camille I., 5,179,993, Cl. 164-46.000.
Farwell, William D., 5,181,191, Cl. 368-113.000.
Hsu, Hui-Pin; and Chesler, Ronald B., 5,181,270, Cl. 385-134.000.
Lind, Harold V.; Fried, Walter R.; and Bricker, Jacob L., 5,181,041, Cl. 342-453.000.
Schreiber, Christopher M.; and Crumly, William R., 5,180,311, Cl. 439-74.000.
Hughes Danbury Optical Systems, Inc.: *See*—
Prusak, Joseph P.; and Bassaro, Anthony, 5,180,150, Cl. 269-254.00R.
Hughes, John L., to Intevac, Inc. Sputter coating source. 5,180,478, Cl. 204-298.090.
Huignard, Jean-Pierre: *See*—
Nicolas, Christophe; Loiseaux, Brigitte; Huignard, Jean-Pierre; and Puech, Claude, 5,181,054, Cl. 353-20.000.
Hull, John W., Jr.: *See*—
Tai, Eva F.; Hull, John W., Jr.; and First, Kenneth E., 5,180,700, Cl. 502-50.000.
Hundt, Gary, to Progressive Technologies, Inc. Waste container. 5,180,076, Cl. 220-420.000.
Hunt, Thomas R. Tool for handling wheel assemblies and method for manipulation thereof. 5,180,141, Cl. 254-131.000.
Hunter, Joseph H., to General Motors Corporation. Hydraulic control system for vehicular automatic transmissions. 5,179,874, Cl. 74-733.100.
Huntwork, Daniel: *See*—
Van Hofwegen, Lloyd; Hsung, Jean-Cheui; and Huntwork, Daniel, 5,179,945, Cl. 128-419.00D.
Hurley, Terry R.: *See*—
Richards, John W.; Pearman, James B.; and Hurley, Terry R., 5,181,114, Cl. 358-146.000.
Husa, Robert K.; Hallinan, E. Ann; Lesne, Michel; and Herin, Marc, to G. D. Searle & Co. 2- and 3-alkoxy or hydroxy-8-substituted-dibenz[b,f]-[1,4]oxazepine-10(11H)-carboxylic acid, substituted hydrazides and methods for treating pain. 5,180,720, Cl. 514-211.000.
Hussoin, Sajjat: *See*—
Obermayer, Arthur S.; Hendrickson, James B.; and Hussoin, Sajjat, 5,180,821, Cl. 540-465.000.
Hutter, G. Frederick, to Westvaco Corporation. Michael addition aminopolyester resins as dilution extenders for zinc-containing metal resinate inks. 5,180,424, Cl. 106-20.00R.
Hutton, Les; and Kershaw, John. Coin discrimination apparatus. 5,180,046, Cl. 194-319.000.
Hyde, Glenn F.; and White, Gene J., to United Container Machinery Group, Inc. Method of laser hardening corrugating rolls. 5,180,448, Cl. 148-525.000.
Hydril Company: *See*—
Carlson, Douglas W.; and Simons, Stephen P., 5,180,137, Cl. 251-1.300.
Hydrostress AG: *See*—
Bieri, Hans, 5,180,209, Cl. 299-41.000.
Hynes, John T.: *See*—
Crane, Lori A.; Hynes, John T.; Guth, Jules H.; and Strandholm, John J., 5,180,604, Cl. 426-582.000.
Hyundai Electronics Industries Co., Ltd.: *See*—
Kang, Cheol S.; and Lee, Jin H., 5,181,109, Cl. 358-105.000.
Iacoviello, John G.: *See*—
Mao, Chung-Ling; Goldstein, Joel E.; and Iacoviello, John G., 5,180,772, Cl. 524-816.000.
Ibuka, Shigehito; and Lee, Hideki, to Tokyo Electron Limited. Method for the manufacture of boron-containing films by CVD or epitaxial techniques using boron trifluoride. 5,180,692, Cl. 437-240.000.
Ibuki, Koichiro: *See*—
Hikasa, Tadashi; Ibuki, Koichiro; Hamanaka, Tatsuo; and Mizumori, Motoo, 5,180,769, Cl. 524-525.000.
Ichikawa, Yataro; Hamamoto, Kimihiko; and Tokashiki, Michiyuki, to Teijin Limited. Method of cultivating animal or plant cells. 5,180,676, Cl. 435-240.100.
Ichikawa, Yoshihiro: *See*—
Tsunoda, Hideo; and Ichikawa, Yoshihiro, 5,181,024, Cl. 340-825.690.
Idemitsu Petrochemical Company Limited: *See*—
Hosoya, Ikuo; and Yoneyama, Yasuhiro, 5,180,571, Cl. 423-446.000.
Nakamura, Shinichi; Tubokura, Yutaka; and Terada, Eiichi, 5,180,780, Cl. 525-96.000.
Idemoto, Morito; Inoue, Naohiko; and Noguchi, Yasuo, to Sumitomo Bakelite Company Company Limited. Operation device. 5,180,363, Cl. 202-32.000.
Iida, Setsuko: *See*—
Sugiyama, Ikuo; Ishibashi, Kazuhisa; Takakusaki, Nobuyuki; Maruhashi, Yoshitsugu; Nishimura, Yasushi; Koyama, Hiroshi; Iida, Setsuko; and Sato, Koji, 5,180,893, Cl. 219-10.430.
Iida, Tetsuya: *See*—
Takakura, Hiroshi; Yamaguchi, Akira; and Iida, Tetsuya, 5,181,034, Cl. 341-144.000.
Iida, Yashuhiro: *See*—
Inanaga, Kiyofumi; Iida, Yashuhiro; Sogawa, Hiroyuki; and Yabe, Susumu, 5,181,248, Cl. 381-25.000.
Iikubo, Tomohito: *See*—
Tsukuta, Kenji; and Iikubo, Tomohito, 5,180,446, Cl. 148-422.000.

Iino, Tadashi: *See*—
Furuya, Yoshiyuki; Iino, Tadashi; and Aoki, Kunimitsu, 5,181,012, Cl. 340-461.000.

Iino, Yutaka: *See*—
Oaki, Junji; Adachi, Shuichi; Iino, Yutaka; and Shigemasa, Takashi, 5,180,956, Cl. 318-568.110.

Iizuka, Shigeo, to Yoshino Kogyosho Co., Ltd. Liquid container with specific valve. 5,180,245, Cl. 401-278.000.

Ikeda, Hiromichi: *See*—
Fukasawa, Fumiaki; and Ikeda, Hiromichi, 5,180,453, Cl. 152-209.00R.

Ikeda, Mitsunori, to Kabushikigaisha Sanmanekin Kougei. Joint structure for window dummy. 5,180,086, Cl. 223-66.000.

Ikeda, Takeshi: *See*—
Sakuragi, Satoshi; Ikeda, Takeshi; and Kuroda, Takashi, 5,181,240, Cl. 379-98.000.

Ikeuchi, Masayuki: *See*—
Murata, Shigemi; and Ikeuchi, Masayuki, 5,180,983, Cl. 324-399.000.
Murata, Shigemi; and Ikeuchi, Masayuki, 5,180,984, Cl. 324-399.000.

Ikezawa, Toshikazu: *See*—
Tsuchimoto, Yoshihiro; Ikezawa, Toshikazu; Morihiro, Naoki; and Shimizu, Naoya, 5,180,412, Cl. 65-66.000.

Illinois Tool Works Inc.: *See*—
Nedbal, Ralph G., 5,180,643, Cl. 429-91.000.

Imamura, Hirokatsu: *See*—
Umise, Shigeki; and Imamura, Hirokatsu, 5,180,607, Cl. 427-8.000.

Imamura, Yoshinori: *See*—
Usagawa, Toshiyuki; Imamura, Yoshinori; Okuhira, Hidekazu; Goto, Shigeo; Kobayashi, Masayoshi; and Takatani, Shinichiro, 5,181,087, Cl. 257-194.000.

Imazu, Katsuhiro: *See*—
Matsui, Kenzo; and Imazu, Katsuhiro, 5,179,854, Cl. 72-349.000.

IMO Industries Inc.: *See*—
DiRe, John, 5,180,298, Cl. 418-181.000.

Imperial Chemical Industries PLC: *See*—
Ballard, Denis G. H.; Haddleton, David M.; and Twose, David L., 5,180,799, Cl. 526-177.000.
Gibbard, Howard C., 5,180,803, Cl. 528-488.000.

Inaba, Mamoru: *See*—
Tarumi, Yoshihiko; Takekoshi, Atuhisa; Inaba, Mamoru; Nishi, Yoshiro; Sakurai, Masaaki; Sakamoto, Satoshi; and Sato, Kimihiko, 5,180,228, Cl. 374-139.000.

Inagaki, Hidemitsu: *See*—
Yamashita, Mitugu; Kawamoto, Mutsumi; and Inagaki, Hidemitsu, 5,180,180, Cl. 280-96.000.

Inanaga, Kiyofumi; Iida, Yashuhiro; Sogawa, Hiroyuki; and Yabe, Susumu, to Sony Corporation. Acoustic signal reproducing apparatus. 5,181,248, Cl. 381-25.000.

Inasaki, Yutaka, to Fuji Xerox Co., Ltd. Fixing unit for picture image forming equipment having a three layered fixing roller. 5,180,899, Cl. 219-469.000.

Inax Corporation: *See*—
Araki, Osamu, 5,180,140, Cl. 251-291.000.

Inazuki, Yukio: *See*—
Yamaguchi, Toru; Inazuki, Yukio; and Nakazawa, Hideo, 5,180,554, Cl. 422-86.000.

INCO Limited: *See*—
Marcuson, Samuel W.; Landolt, Carlos A.; Amson, James H.; and Davies, Haydn, 5,180,423, Cl. 75-649.000.

Independent Cable, Inc.: *See*—
Pendergrass, Paul J.; and Allcock, Edmund, 5,180,890, Cl. 174-117.00F.

Industrias Techno-Matic S.A.: *See*—
Gabas, Carlos, 5,180,202, Cl. 296-97.900.

Ingersoll-Rand Company: *See*—
Thiry, Steven A.; Meister, Ronald J.; and Ropp, David J., 5,180,019, Cl. 173-168.000.

Inomet, Inc.: *See*—
Knudson, Mark B., 5,179,951, Cl. 128-633.000.

Inomiya, Yukihiro: *See*—
Akune, Kenichi; Watanabe, Naotaka; Inomiya, Yukihiro; Itoda, Hiroshi; Arai, Takeo; and Funato, Reiko, 5,180,473, Cl. 162-168.200.

Inoue, Hiroshi; Takabayashi, Seiichirou; Muramatsu, Tadao; Funagoshi, Tsutomu; and Hirano, Tetsuji, to Ube Industries, Ltd. Heat resistant adhesive composition. 5,180,627, Cl. 428-214.000.

Inoue, Hiroshi: *See*—
Ohyama, Minoru; Yamazaki, Tetsuhiro; Inoue, Hiroshi; and Konno, Toshio, 5,180,909, Cl. 250-216.000.

Inoue, Hitoshi: *See*—
Chiba, Katsuyoshi; Katsumoto, Masayuki; Uesaka, Yasutaro; Fukke, Hajime; Ishihara, Heigo; Matsuyama, Iwao; Kodama, Naoki; Inoue, Hitoshi; and Terada, Yoshiharu, 5,180,608, Cl. 427-560.000.
Fukke, Hajime; Akagi, Motoo; Matsuyama, Iwao; Katsumoto, Masayuki; Inoue, Hitoshi; Kodama, Naoki; and Uesaka, Yasutaro, 5,180,616, Cl. 428-64.000.

Inoue, Katsuki, to Shibuya Kogyo Co., Ltd. Cartoning apparatus. 5,180,355, Cl. 493-315.000.

Inoue, Masato; Tajima, Minoru; Orime, Nobutake; and Katagi, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Method of measuring the null angle of a monopulse antenna and apparatus therefor. 5,181,040, Cl. 342-149.000.

Inoue, Michihiro: *See*—
Matsuo, Naoto; Okada, Shozo; and Inoue, Michihiro, 5,181,089, Cl. 257-299.000.

Inoue, Mitsuo: *See*—
Sato, Yukio; Suzuki, Akihiro; Inoue, Mitsuo; Haruta, Kenyu; and Nagai, Haruhiko, 5,181,217, Cl. 372-38.000.

Inoue, Naohiko: *See*—
Idemoto, Morito; Inoue, Naohiko; and Noguchi, Yasuo, 5,180,363, Cl. 202-32.000.

Inoue, Ryoji, to Hitachi Metals, Ltd. High-toughness ZrO_2 sintered body and method of producing same. 5,180,696, Cl. 501-87.000.

Inoue, Yoshifumi: *See*—
Arai, Masatoshi; Inoue, Yoshifumi; and Inoue, Yoshio, 5,180,771, Cl. 524-588.000.

Inoue, Yoshio: *See*—
Arai, Masatoshi; Inoue, Yoshifumi; and Inoue, Yoshio, 5,180,771, Cl. 524-588.000.

Instant Firestop Inc.: *See*—
Sakno, Michael, 5,180,063, Cl. 206-582.000.

Institut Francais du Petrole: *See*—
Wittrisch, Christian, 5,180,011, Cl. 166-250.000.

Intel Corporation: *See*—
McDaniel, Bart R., 5,180,988, Cl. 330-282.000.

Intelligent Medical Systems, Inc.: *See*—
O'Hara, Gary J.; Phillips, David B.; and Hingorani, Kishan G., 5,179,936, Cl. 128-9.000.

Interactive Television Systems, Inc.: *See*—
Rhoades, Donald E., 5,181,107, Cl. 358-86.000.

International Business Machines Corporation: *See*—
Frey, Alexander H., Jr.; Gould, Joel M.; and Higgins, Charles M., Jr., 5,181,017, Cl. 340-825.020.
Harrison, Colin G., 5,181,200, Cl. 370-85.100.
Karidis, John P.; McVicker, Gerard; and Pawletko, Joseph P., 5,180,955, Cl. 318-568.100.
Trumbo, Brian A., 5,180,891, Cl. 178-18.000.

International Flavors & Fragrances Inc.: *See*—
Lindauer, Jerome I., 5,180,107, Cl. 239-35.000.

International Paper Company: *See*—
Quick, James R.; Alexander, James L.; Lai, Christopher C.; Mathews, Susan A.; and Wenzel, Donna J., 5,180,894, Cl. 219-10.55E.

Interroll Holding A.G.: *See*—
Hall, David V., 5,180,344, Cl. 474-148.000.

Intevac, Inc.: *See*—
Hughes, John L., 5,180,478, Cl. 204-298.090.

Inui, Naoki: *See*—
Nagasaki, Hideo; Inui, Naoki; Yachigo, Shinichi; Abe, Hiroomi; Fujii, Takeshi; and Yamamoto, Masashi, 5,180,764, Cl. 524-260.000.

Inuzuka, Takeshi: *See*—
Sakakibara, Shiro; Inuzuka, Takeshi; Hattori, Masashi; Fukatsu, Hironari; and Takaki, Shinichi, 5,179,867, Cl. 74-335.000.

Irie, Yasushi: *See*—
Fukazawa, Fumie; Irie, Yasushi; Shimazaki, Hiroshi; Yabuuchi, Katuya; and Shimba, Satoru, 5,180,657, Cl. 430-503.000.

Irie, Yoichiro, to Mita Industrial Co., Ltd. Sorter. 5,180,152, Cl. 270-53.000.

Irshid, Mansour I.: *See*—
Kavehrad, Mohsen; and Irshid, Mansour I., 5,181,136, Cl. 359-190.000.

IRT Corporation: *See*—
Smith, Steven W., 5,181,234, Cl. 378-87.000.

Ishibashi, Kazuhisa: *See*—
Sugiyama, Ikuo; Ishibashi, Kazuhisa; Takakusaki, Nobuyuki; Maruhashi, Yoshitsugu; Nishimura, Yasushi; Koyama, Hiroshi; Iida, Setsuko; and Sato, Koji, 5,180,893, Cl. 219-10.430.

Ishibashi, Satoru; Nakamura, Kyuzo; Higuchi, Yasushi; Komatsu, Takashi; Murata, Yuzo; and Ota, Yoshifumi, to Nihon Shinku Gijutsu Kabushiki Kaisha. Method for producing transparent conductive films. 5,180,476, Cl. 204-192.290.

Ishibashi, Tadao; and Yamada, Kazuhiro, to Chisso Corporation. Opaque and pearlescent, laminated and stretched products, and method for making them. 5,180,626, Cl. 428-213.000.

Ishidoshiro, Hiroshi: *See*—
Sando, Yoshiteru; Nakano, Eiichi; and Ishidoshiro, Hiroshi, 5,180,497, Cl. 210-665.000.

Ishige, Sadao: *See*—
Yamaguchi, Jun; Ishige, Sadao; Sato, Kozo; Washizu, Shintaro; and Itoh, Isamu, 5,180,652, Cl. 430-281.000.

Ishihara, Heigo: *See*—
Chiba, Katsuyoshi; Katsumoto, Masayuki; Uesaka, Yasutaro; Fukke, Hajime; Ishihara, Heigo; Matsuyama, Iwao; Kodama, Naoki; Inoue, Hitoshi; and Terada, Yoshiharu, 5,180,608, Cl. 427-560.000.

Ishihara, Yuji: *See*—
Goto, Giichi; Nagaoka, Akinobu; and Ishihara, Yuji, 5,180,746, Cl. 514-654.000.

Ishii, Masami: *See*—
Okabayashi, Makoto; Ishii, Masami; Mita, Juniti; and Shinagawa, Shigeo, 5,180,099, Cl. 228-263.140.

Ishikawa, Masao: *See*—
Kobayashi, Hiroaki; Koboshi, Shigeharu; Kurematsu, Masayuki; and Ishikawa, Masao, 5,180,656, Cl. 430-393.000.

Ishikawa, Masayuki; Okuda, Hajime; Shiozawa, Hideo; Itaya, Kazuhiko; Watanabe, Yukio; Suzuki, Mariko; and Hatakoshi, Genichi, to Kabushiki Kaisha Toshiba. Manufacturing method of semicon-

ductor laser with non-absorbing mirror structure. 5,181,218, Cl. 372-45.000.

Ishikawajima-Harima Heavy Industries Co., Ltd.: *See*—
Morishima, Satoshi; and Chidiiwa, Sakae, 5,180,561, Cl. 422-191.000.
Yamaguchi, Toru; Inazuki, Yukio; and Nakazawa, Hideo, 5,180,554, Cl. 422-86.000.

Ishikura, Kazuo: *See*—
Katsumata, Kenji; Hirahata, Shigeru; Sugiyama, Masato; Matono, Takaaki; Ishikura, Kazuo; Suzuki, Sunao; and Kaizaki, Kazuhiro, 5,181,110, Cl. 358-140.000.

Ishimoto, Shinji: *See*—
Hirai, Mutsumi; Ishimoto, Shinji; and Ito, Kenichi, 5,180,527, Cl. 252-638.000.

Ishimoto, Yasuhiko: *See*—
Katayama, Yasuyuki; Ishimoto, Yasuhiko; Horide, Fumio; Tsuda, Shigenori; and Nishioka, Fumio, 5,180,420, Cl. 504-116.000.

Ishiuchi, Yukio: *See*—
Hiramatsu, Yasushi; Ishiuchi, Yukio; and Nagashima, Hiromitsu, 5,180,573, Cl. 423-584.000.

Ishiwatari, Takao: *See*—
Tomioka, Hiroki; Sakamoto, Noriyasu; Umeda, Kimitoshi; Fujimoto, Hiroaki; Ishiwatari, Takao; and Kisida, Hirosi, 5,180,732, Cl. 514-396.000.

Ismailov, Marat B.: *See*—
Merzhanov, Alexandr G.; Xandopulo, Georgy I.; Nersesian, Mikael D.; Ismailov, Marat B.; and Borovinskaya, Inna P., 5,180,698, Cl. 501-132.000.

Isobe, Michiro, to Nissin Electric Company, Limited. Method and apparatus for measuring ion beam collimation, shaping the ion beam and controlling scanning thereof. 5,180,918, Cl. 250-492.200.

Isover Saint-Gobain: *See*—
Vojtech, Strnad, 5,179,902, Cl. 110-248.000.

Isowa, Yoshikazu; Sato, Yoshiaki; Nakashima, Yoshiharu; Masaki, Mitsuo; Miyake, Norihisa; Uehara, Masaki; and Hirate, Kenji, to Fujirebio Kabushiki Kaisha; and Nippon Chemiphar Co., Ltd. Petide antidementia and nootropic agents. 5,180,712, Cl. 514-16.000.

Isshiki, Naotsugu: *See*—
Yoshino, Syoichi; Izaki, Hiroshi; Yoshino, Masanori; Kasai, Fumio; Tokunaga, Yosimitu; and Isshiki, Naotsugu, 5,180,539, Cl. 266-202.000.

Istratoff, Glenn J.: *See*—
Cordner, Edward T., Jr.; Payne, Steven R.; and Istratoff, Glenn J., 5,179,983, Cl. 141-27.000.

Italtel Societa Italiana Telecomunicazioni S.p.A.: *See*—
Chiaretti, Guido; and Blandano, Francesco, 5,181,264, Cl. 385-33.000.

Itaya, Hisao; Akebi, Kazuhiko; Okabe, Minoru; and Nakagawa, Satoru, to Gunze Limited. Input system including resistance film touch panel and pushed position detecting device. 5,181,030, Cl. 341-20.000.

Itaya, Kazuhiko: *See*—
Ishikawa, Masayuki; Okuda, Hajime; Shiozawa, Hideo; Itaya, Kazuhiko; Watanabe, Yukio; Suzuki, Mariko; and Hatakoshi, Genichi, 5,181,218, Cl. 372-45.000.

Ito, Hiroki, to Mitsubishi Denki Kabushiki Kaisha. Thin film deposition apparatus. 5,180,477, Cl. 204-298.050.

Ito, Kanji: *See*—
Tagami, Shigeru; Akimoto, Kazuo; Ito, Kanji; and Matsushita, Katsuhiko, 5,181,063, Cl. 354-435.000.
Tagami, Shigeru; Akimoto, Kazuo; Matsushita, Katsuhiko; and Ito, Kanji, 5,181,064, Cl. 354-437.000.

Ito, Kenichi: *See*—
Hirai, Mutsumi; Ishimoto, Shinji; and Ito, Kenichi, 5,180,527, Cl. 252-638.000.

Ito, Kiyotaka: *See*—
Kato, Masayuki; Nishino, Shigetaka; Ito, Kiyotaka; and Takasugi, Hisashi, 5,180,728, Cl. 514-267.000.

Ito, Yasuhito: *See*—
Sukeyasu, Ryuzo; Kishina, Yoshiyuki; Okawa, Masao; Horigome, Naoyuki; and Ito, Yasuhito, 5,179,819, Cl. 53-442.000.

Itoda, Hiroshi: *See*—
Akune, Kenichi; Watanabe, Naotaka; Inomiya, Yukihiro; Itoda, Hiroshi; Arai, Takeo; and Funato, Reiko, 5,180,473, Cl. 162-168.200.

Itoh, Homare; Shin, Takashi; Yajima, Takahisa; and Fukuyasu, Shigeki, to Asahi Kasei Kogyo Kabushiki Kaisha. Ascorbate oxidase isolated from Acremonium sp. HI-25 ferm BP-3124. 5,180,672, Cl. 435-190.000.

Itoh, Isamu: *See*—
Yamaguchi, Jun; Ishige, Sadao; Sato, Kozo; Washizu, Shintaro; and Itoh, Isamu, 5,180,652, Cl. 430-281.000.

Itojima, Fumiaki: *See*—
Choshitani, Hitoshi; Osaka, Takahide; Itojima, Fumiaki; and Yasuda, Masashi, 5,180,958, Cl. 318-623.000.

Itozaki, Hideo: *See*—
Harada, Keizo; Hattori, Hisao; and Itozaki, Hideo, 5,180,708, Cl. 505-1.000.

ITT Corporation: *See*—
Willems, David A., 5,180,998, Cl. 333-164.000.

Iura, Kazuo; Yamano, Yoshiaki; and Saka, Kazuhito, to Sumitomo Wiring Systems Ltd. Method of forming flat multicore wire. 5,179,779, Cl. 29-877.000.

Ivanov, Konstantin: *See*—
Cascio, Jack; Ivanov, Konstantin; Alpern, Marvin; Cerwin, Robert; and Siernos, Joseph, 5,180,053, Cl. 206-63.300.

IVHS Technologies, Inc.: *See*—
Asbury, Jimmie; and Davis, John W., 5,181,038, Cl. 342-70.000.

Iwade, Takashi; and Nagata, Kosei, to Toray Engineering Co., Ltd. Cleaning belts for the drafting mechanism of a spinning machine. 5,179,764, Cl. 19-245.000.

Iwakawa, Hiroaki: *See*—
Narishima, Ryousuke; Ogiri, Tetsuo; Kawamura, Youji; and Iwakawa, Hiroaki, 5,180,257, Cl. 406-173.000.

Iwakura, Takeshige: *See*—
Hayakawa, Yuichi; Iwakura, Takeshige; Tsutsui, Hiroshi; Hirano, Atsushi; and Miyazaki, Makoto, 5,181,150, Cl. 360-121.000.

Iwamoto, Shigeru: *See*—
Kawasaki, Masahiro; Takahashi, Hiroyuki; and Iwamoto, Shigeru, 5,181,061, Cl. 354-400.000.

Iwamoto, Taro: *See*—
Kawashima, Yoshiaki; Iwamoto, Taro; and Tejima, Kikuo, 5,180,522, Cl. 252-311.000.

Iwano, Hideaki: *See*—
Mori, Katsumi; Asaka, Tatsuya; and Iwano, Hideaki, 5,181,219, Cl. 372-45.000.
Mori, Katsumi; Asaka, Tatsuya; and Iwano, Hideaki, 5,181,221, Cl. 372-46.000.

Iwasaki, Masayoshi: *See*—
Moriya, Iwao; Sugie, Masayuki; Iwasaki, Masayoshi; and Sakata, Junichiro, 5,180,603, Cl. 426-556.000.

Iwasaki, Motohiro: *See*—
Honbo, Yoichi; Yoshizaki, Satoshi; and Iwasaki, Motohiro, 5,180,457, Cl. 152-541.000.

Iwata, Kouichi; and Fukaya, Katsuyoshi, to Aisan Kogyo Kabushiki Kaisha. Flow control device. 5,179,977, Cl. 137-625.500.

Iwata, Satoshi; and Shiomi, Michio, to Kyowa Hakko Kogyo, Ltd. Method for purification of mitomycin C. 5,180,670, Cl. 435-119.000.

Iwata, Yoichi: *See*—
Kuroda, Shigetaka; and Iwata, Yoichi, 5,179,833, Cl. 60-276.000.

Iwato, Noboru: *See*—
Yamashita, Masami; Iwato, Noboru; Mine, Hideki; and Toshiaki, Wada, 5,181,151, Cl. 360-126.000.

Iwatsu Electric Co., Ltd.: *See*—
Tsuboi, Kiyoshi, 5,179,860, Cl. 73-579.000.

Iwayama, Kazuyoshi; and Honda, Hiroaki, to Toray Industries, Inc. Process for isomerizing trichlorobenzene. 5,180,862, Cl. 570-202.000.

Izaki, Hiroshi: *See*—
Yoshino, Syoichi; Izaki, Hiroshi; Yoshino, Masanori; Kasai, Fumio; Tokunaga, Yosimitu; and Isshiki, Naotsugu, 5,180,539, Cl. 266-202.000.

Izen, Paul G.: *See*—
Drake, Gerald E.; Gray, Thomas R.; and Izen, Paul G., 5,180,379, Cl. 606-32.000.

Izumi, Toshihiro: *See*—
Oshibe, Yoshihiro; Izumi, Toshihiro; Doya, Hideki; Ohmura, Hiroshi; Yamamoto, Yasuhiro; and Kumazawa, Keiji, 5,180,760, Cl. 523-169.000.

J. Eberspacher: *See*—
Worner, Siegfried; Wirth, Georg; and Zacke, Peter, 5,180,408, Cl. 55-482.000.

J.M. Huber Corporation: *See*—
Harrison, John M. M., 5,180,511, Cl. 252-61.000.

J.M. Voith GmbH: *See*—
Sollinger, Hans-Peter, 5,179,909, Cl. 118-119.000.

Jablonski, David: *See*—
Czubatyj, Wolodymyr; Ovshinsky, Stanford R.; Wicker, Guy C.; Beglau, David; Himmler, Ronald; Jablonski, David; and Guha, Subhendu, 5,180,690, Cl. 437-233.000.

Jackson, Alan D.: *See*—
Casey, Todd A.; and Jackson, Alan D., 5,179,835, Cl. 60-386.000.

Jackson, Melvin D. Sidewall support for dual containment vessels. 5,179,971, Cl. 137-264.000.

Jacobs, Norman L. Metal-free lubricant composition containing graphite for use in threaded connections. 5,180,509, Cl. 252-22.000.

Jacobs, William, III; Luciw, Fred W.; Kancans, Ilze B.; Thomas, Daniel W.; Boldizer, Leslie; and Lees, Robert G., to American Cyanamid Company. Process for the preparation of monomeric tetramethoxymethylglycoloril. 5,180,835, Cl. 548-303.400.

Jacobson, Howard W.; Schoilla, Michael H.; and Samuels, Sam L., to Du Pont de Nemours, E. I., and Company. Antimicrobial compositions, process for preparing the same and use. 5,180,585, Cl. 424-405.000.

Jacoby, Elliot G., Jr.: *See*—
Dierenbach, Karl; Jacoby, Elliot G., Jr.; Snavely, Dan A.; Tucker, Darryl W.; Walck, Scott N.; and Walck, Scott N., 5,180,886, Cl. 174-66.000.

Jacquot, Roland; and Mercier, Claude, to Rhone-Poulenc Nutrition Animale. Process for the preparation of citral. 5,180,855, Cl. 568-486.000.

Jadach, Albert A. Locating plug for the centerlines of holes. 5,179,788, Cl. 33-644.000.

Jain, Nemichand B.: *See*—
Joshi, Yatindra M.; Chiesa, Pierina; and Jain, Nemichand B., 5,180,589, Cl. 424-465.000.

Jamal, Mustafa M.: *See*—
Sauer, Robert D.; and Jamal, Mustafa M., 5,180,471, Cl. 162-112.000.

James River Corporation of Virginia: *See*—
Park, John J.; Katz, Leon; and Gaylord, Norman G., 5,180,751, Cl. 521-51.000.

Jang, Ki-sun: *See*—
Kim, Jong-woo; and Jang, Ki-sun, 5,180,233, Cl. 400-120.000.
Jannone, Brian S.: *See*—
Polefka, Thomas G.; Sanai, Deborah S.; and Jannone, Brian S., 5,180,577, Cl. 424-52.000.
Janssen Pharmaceutica N.V.: *See*—
Freyne, Eddy J. E.; Raeymaekers, Alfons H. M.; Sipido, Victor; and Venet, Marc G., 5,180,832, Cl. 546-333.000.
Japan Digital Laboratory Co., Ltd.: *See*—
Sherick, Michael T., 5,179,880, Cl. 83-83.000.
Japan Tobacco Inc.: *See*—
Komori, Mikio; Adachi, Kazuyu; and Sato, Shuichi, 5,179,965, Cl. 131-281.000.
Jared, Roy A.: *See*—
Eihusen, John A.; and Jared, Roy A., 5,180,490, Cl. 210-239.000.
Jarocki, George J.; and Drzewiecki, Tadeusz M., to Coca-Cola Company, The. Beverage dispensing valve. 5,179,970, Cl. 137-9.000.
Jarosek, Gordon G.: *See*—
Block, James P.; Levasheff, Stanley W.; and Jarosek, Gordon G., 5,179,770, Cl. 29-17.300.
Jarvis Chemicals & Paper Company: *See*—
Forti, Ernesto R.; and Jarvis, Judith A., 5,180,060, Cl. 206-522.000.
Jarvis, Judith A.: *See*—
Forti, Ernesto R.; and Jarvis, Judith A., 5,180,060, Cl. 206-522.000.
Jarvis Products Corporation: *See*—
Meyer, Philip G., 5,180,329, Cl. 452-166.000.
Jaskie, James E.: *See*—
Dworsky, Lawrence N.; Jaskie, James E.; and Kane, Robert C., 5,180,951, Cl. 315-169.300.
Jaskolka, Heinz; Rahnenfuhrer, Eckhard; and Schulze, Albert, to Rheinmetall GmbH. Ammunition. 5,180,883, Cl. 102-443.000.
Jeannotte, Anthony C.; Gilby, Anthony C.; Cheney, M. Charles; and Meneghelli, Barry J., to Foxboro Company, The. On-line titration using colorimetric end point detection. 5,181,082, Cl. 356-436.000.
Jeneric/Pentron, Inc.: *See*—
Prasad, Arun; and Panzera, Carlino, 5,180,427, Cl. 106-35.000.
Jeng, John. Combined cup. 5,180,079, Cl. 220-705.000.
Jenkins, Peter D., to British Telecommunications public limited company. Optical fiber storage system and method of installing optical fiber using same. 5,181,271, Cl. 385-135.000.
Jenoptik GmbH: *See*—
Haupt, Jens; Haupt, Kirstin; and Hornhauer, Henry, 5,181,154, Cl. 361-17.000.
Jenoptik Jena GmbH: *See*—
Klose, Heinrich, 5,180,127, Cl. 248-188.300.
Jenq, Ching S., to Silicon Storage Technology, Inc. Low power voltage sensing circuit. 5,181,187, Cl. 365-182.000.
Jensen, Brian D.: *See*—
Kouzel, Richard L.; Penn, Aubery W.; Jensen, Brian D.; and Dicke, Paul A., 5,180,003, Cl. 165-121.000.
Jensen, Jack L.: *See*—
Frantz, Brian H.; Jensen, Jack L.; and Miller, Gregory A., 5,180,188, Cl. 280-740.000.
Jeong, Kwang L.: *See*—
Ha, Jae M.; Jeong, Kwang L.; and Suh, Sung S., 5,180,575, Cl. 404-49.000.
Jericho, Karl: *See*—
Drechsel, Dieter; and Jericho, Karl, 5,180,562, Cl. 422-429.000.
Jermik Systems, Ltd.: *See*—
Kursar, Gerald H., 5,179,953, Cl. 128-645.000.
Jerome Group Inc., The: *See*—
Moore, George E.; and Tweardy, Lisa A. G., 5,180,361, Cl. 602-18.000.
Jessee, Paul E.: *See*—
Blanchette, Gregory J.; and Jessee, Paul E., 5,181,148, Cl. 360-99.080.
Ji, Heon Pyeong, to Gold Star Co., Ltd. Automatic electric card rewinding apparatus with contacts for supplying electric power. 5,180,040, Cl. 191-12.20R.
Jian, Yi-Min: *See*—
Chow, Hong-Jien; and Jian, Yi-Min, 5,179,911, Cl. 119-5.000.
Jio, Chain-Fou. Clothespin. 5,179,768, Cl. 24-545.000.
John, Laurence N.; and Corner, Neil A., to Smiths Industries Public Limited Company. Optical temperature sensors. 5,180,227, Cl. 374-131.000.
John Zink Company, a Division of Koch Engineering Company, Inc.: *See*—
Schwartz, Robert E.; and Trimble, Robert R., 5,180,302, Cl. 431-348.000.
Johnson, Gary: *See*—
Fishman, Henry; Olshaker, Robert; and Johnson, Gary, 5,179,959, Cl. 128-743.000.
Johnson, Graham, to Warner-Lambert Company. Polycyclic amines useful as cerebrovascular agents. 5,180,736, Cl. 514-454.000.
Johnson & Johnson Medical, Inc.: *See*—
Boardman, Franklin; and Saferstein, Lowell, 5,180,398, Cl. 8-181.000.
Johnson, Kenneth M.; and Monaghan, Samira E., to Baxter International Inc. Systems and methods for removing undesired matter from blood cells. 5,180,504, Cl. 210-767.000.
Johnson, Kenric J., to Siemens Automotive L.P. Solenoid coil assembly. 5,181,004, Cl. 336-198.000.
Johnson, Marvin M.: *See*—
Pennella, Filippo; Lin, Fan-Nan; and Johnson, Marvin M., 5,180,485, Cl. 208-254.00R.
Johnson, William B.: *See*—
Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; White, Danny R.; Johnson, William B.; and Aghajanian, Michael K., 5,180,697, Cl. 501-96.000.
Johnston, Charles J.: *See*—
Van Loan, David R.; Johnston, Charles J.; and Swart, Mark A., 5,180,976, Cl. 324-158.00F.
Jolissaint, Charles H., to ROLM Systems. Call tagging user information in a telephonic environment. 5,181,239, Cl. 379-96.000.
Jones, Gary A., to Hammer Corporation. Rotary cuff exercise machine. 5,180,354, Cl. 482-133.000.
Jones, John L. R., to Pitney Bowes plc. Machine incorporating an accounts verification system. 5,181,245, Cl. 380-23.000.
Jones, Kermit: *See*—
DiDio, Gary M.; Jones, Kermit; Hoffman, Kevin; Laarman, Timothy; Call, Jon; and Nath, Prem, 5,180,434, Cl. 118-718.000.
Jones, Kerry A.: *See*—
Wenholz, Bruce; Gault, R. H.; and Jones, Kerry A., 5,180,289, Cl. 417-53.000.
Jones, Peter C.: *See*—
Backer, Marcella R.; Cavender, Ralston R., Jr.; Jones, Peter C.; and Murphy, James A., 5,180,411, Cl. 65-3.120.
Jordan, Brett M. Exercise machine. 5,180,161, Cl. 482-143.000.
Jordan, Jeff B., to Southern Audio Services, Inc. Loudspeaker assembly. 5,181,253, Cl. 381-199.000.
Jorgensen, Richard A., to DNA Plant Technology Corporation. Transformation of plants to introduce closely linked markers. 5,180,873, Cl. 800-205.000.
Joshi, Yatindra M.; Chiesa, Pierina; and Jain, Nemichand B., to E. R. Squibb & Sons, Inc. Pravastatin pharmaceuatical compositions having good stability. 5,180,589, Cl. 424-465.000.
Jozefowicz, Mark A., to Alcan International Limited. Liquid and/or temperature activated elapsed time indicators suitable, in particular, as doneness indicators for foodstuffs. 5,180,598, Cl. 426-88.000.
Jujo Paper Co., Ltd.: *See*—
Kojima, Yutaka; and Omori, Takashi, 5,180,624, Cl. 428-211.000.
Juki Corporation: *See*—
Asai, Toshimasa, 5,180,155, Cl. 271-21.000.
Hoyano, Yuhei; and Sato, Masahiko, 5,179,904, Cl. 112-67.000.
Junino, Alex: *See*—
Baudry, Alain; Junino, Alex; and Richard, Herve , 5,180,400, Cl. 8-405.000.
Justice, Kyle A., to Ultimate Manufacturing. Interlocking toy components. 5,180,323, Cl. 446-120.000.
Juvigny, Daniel: *See*—
Grand, Jean-Paul; Juvigny, Daniel; Vinuesa, Andre ; and Tortosa, Serge, 5,180,537, Cl. 266-45.000.
Kabushiki Kaisha CSK: *See*—
Horie, Kiyoshi, 5,181,194, Cl. 369-44.250.
Kabushiki Kaisha Daikin Seisakusho: *See*—
Fukushima, Hirotaka; and Takenaka, Mitsuhiko, 5,180,044, Cl. 192-106.100.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Shirasawa, Hidenori; Tanaka, Yoshiki; and Sawaki, Shinji, 5,180,204, Cl. 296-146.00C.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Tanaka, Hiroshi; and Kobayashi, Ryoji, 5,180,252, Cl. 405-144.000.
Kabushiki Kaisha Konoike Gumi: *See*—
Tanaka, Hiroshi; and Kobayashi, Ryoji, 5,180,252, Cl. 405-144.000.
Kabushiki Kaisha Mihama Seisakusho: *See*—
Hama, Mamoru; Mitsuyoshi, Matao; and Hashimoto, Takahiro, 5,179,943, Cl. 128-368.000.
Kabushiki Kaisha Topcon: *See*—
Sano, Eiichi; and Minegishi, Hiroshi, 5,181,055, Cl. 354-62.000.
Kabushiki Kaisha Toshiba: *See*—
Atsumi, Shigeru, 5,181,092, Cl. 257-361.000.
Fukatsu, Yasushi, 5,181,128, Cl. 358-486.000.
Hiramatsu, Kenichi, 5,180,901, Cl. 235-380.000.
Ishikawa, Masayuki; Okuda, Hajime; Shiozawa, Hideo; Itaya, Kazuhiko; Watanabe, Yukio; Suzuki, Mariko; and Hatakoshi, Genichi, 5,181,218, Cl. 372-45.000.
Kanazawa, Hidetoshi, 5,179,842, Cl. 62-158.000.
Mikata, Yuuichi; and Usami, Toshiro, 5,181,088, Cl. 257-331.000.
Nakamura, Ei; Sasaki, Mitsuo; and Nakamura, Hiromi, 5,180,609, Cl. 427-595.000.
Oaki, Junji; Adachi, Shuichi; Iino, Yutaka; and Shigemasa, Takashi, 5,180,956, Cl. 318-568.110.
Ono, Katsuhiro; Anno, Hidero; Sugiura, Hiroyuki; and Kitami, Takayuki, 5,181,235, Cl. 378-133.000.
Sakaya, Kazuhiro; and Kodama, Shoichi, 5,180,273, Cl. 414-404.000.
Sasaki, Katsunari, 5,181,047, Cl. 346-76.0PH.
Tsunoda, Hideo; and Ichikawa, Yoshihiro, 5,181,024, Cl. 340-825.690.
Uchida, Norio; and Kikuiri, Nobutaka, 5,179,863, Cl. 73-865.800.
Yamada, Shu, 5,180,906, Cl. 235-487.000.
Yoshioka, Ritsuo; Ueda, Makoto; Motora, Yuichi; and Nakamura, Mitsuharu, 5,180,544, Cl. 376-333.000.
Kabushiki Kaishi Toshiba: *See*—
Takakura, Hiroshi; Yamaguchi, Akira; and Iida, Tetsuya, 5,181,034, Cl. 341-144.000.
Kabushikigaisha Sanmanekin Kougei: *See*—
Ikeda, Mitsunori, 5,180,086, Cl. 223-66.000.
Kabushki Kaisha Komatsu Seisakusho: *See*—
Nagao, Makoto; and Terada, Keiji, 5,181,258, Cl. 382-28.000.

Kadija, Igor V.: *See*—
Abys, Joseph A.; Kadija, Igor V.; Maisano, Joseph J., Jr.; and Nakahara, Shohei, 5,180,482, Cl. 205-224.000.
Kadomura, Shingo: *See*—
Tatsumi, Tetsuya; and Kadomura, Shingo, 5,180,464, Cl. 156-626.000.
Kai, Junichi; Yasuda, Hiroshi; and Watanabe, Yoshio, to Fujitsu Limited. Method and apparatus for making charged particle beam exposure. 5,180,920, Cl. 250-492.200.
Kaifasz, Patrick: *See*—
Seguela, Brigitte; and Kaifasz, Patrick, 5,180,783, Cl. 525-198.000.
Kaijo Corporation: *See*—
Yanagida, Katsuro; and Hayashizaki, Yoshikatsu, 5,180,094, Cl. 228-4.500.
Kaise, Atsushi; Hirohara, Naoya; Kasahara, Hiroshi; Wakou, Iichi; and Kaneko, Yoichi, to Yagi Antenna Co., Ltd. Microstrip array antenna. 5,181,042, Cl. 343-700.0MS.
Kaizaki, Kazuhiro: *See*—
Katsumata, Kenji; Hirahata, Shigeru; Sugiyama, Masato; Matono, Takaaki; Ishikura, Kazuo; Suzuki, Sunao; and Kaizaki, Kazuhiro, 5,181,110, Cl. 358-140.000.
Nakagaki, Nobufumi; Kurita, Toshiyuki; Murata, Toshinori; Kaizaki, Kazuhiro; Kubota, Sadao; Kamiya, Masanori; Sekiya, Hiroshi; and Fujiwara, Kenichi, 5,181,116, Cl. 358-159.000.
Kaji, Hiroyuki: *See*—
Nakajima, Hiroyuki; and Kaji, Hiroyuki, 5,181,163, Cl. 364-419.000.
Kakuta, Yoshiaki. Apparatus for driving turbo supercharger. 5,179,838, Cl. 60-605.100.
Kalinski, Robert J.; Cerwin, Robert J.; and Alpern, Marvin, to Ethicon, Inc. Oval wrap suture package. 5,179,818, Cl. 53-430.000.
Kamada, Naoki: *See*—
Ueta, Koki; Kamada, Naoki; Mori, Hideo; Endo, Suehiro; and Tajima, Susumu, 5,179,864, Cl. 74-7.00A.
Kaman Aerospace Corporation: *See*—
Keeler, R. Norris, 5,181,135, Cl. 359-141.000.
Kamhi, Victor M.: *See*—
Kuhn, David G.; Furch, Joseph A.; and Kamhi, Victor M., 5,180,734, Cl. 514-426.000.
Kaminski, Jerzy: *See*—
Morand, Peter; Arnsson, John T.; Philogene, Bernard J. R.; MacEachern, Anita M.; Leitch, Leonard C.; and Kaminski, Jerzy, 5,180,838, Cl. 549-59.000.
Kamiya, Akira; and Nakano, Kikuo, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Method for production of sintered ceramic article containing titanium diboride and silicon carbide. 5,180,533, Cl. 264-65.000.
Kamiya, Hajime: *See*—
Sato, Koji; Suzuki, Tokio; Kamiya, Hajime; Nakamura, Kimio; Kosaka, Masahisa; and Ohsora, Tetsuo, 5,181,141, Cl. 359-580.000.
Kamiya, Masanori: *See*—
Nakagaki, Nobufumi; Kurita, Toshiyuki; Murata, Toshinori; Kaizaki, Kazuhiro; Kubota, Sadao; Kamiya, Masanori; Sekiya, Hiroshi; and Fujiwara, Kenichi, 5,181,116, Cl. 358-159.000.
Kamiya, Shin, to Sharp Kabushika Kaisha. Pattern recognition device using a neural network. 5,181,256, Cl. 382-14.000.
Kamo, Yoshihisa: *See*—
Katsumata, Masao; Momata, Kazuhiro; Adachi, Kazuyoshi; Takeura, Tooru; Kitada, Masahiro; Kamo, Yoshihisa; and Yoshimatsu, Toshikane, 5,181,149, Cl. 360-119.000.
Kamoshita, Ryuji; Kashiwagi, Hiroki; and Takimoto, Koji, to Monsanto Kasei Company. Thermoplastic resin compositions resistant to fluorinated/chlorinated hydrocarbons and the use thereof. 5,180,779, Cl. 525-87.000.
Kanazawa, Hidetoshi, to Kabushiki Kaisha Toshiba. Inverter controlled air conditioner capable of effectively reducing a rush current at starting. 5,179,842, Cl. 62-158.000.
Kancans, Ilze B.: *See*—
Jacobs, William, III; Luciw, Fred W.; Kancans, Ilze B.; Thomas, Daniel W.; Boldizer, Leslie; and Lees, Robert G., 5,180,835, Cl. 548-303.400.
Kane, Robert C.: *See*—
Dworsky, Lawrence N.; Jaskie, James E.; and Kane, Robert C., 5,180,951, Cl. 315-169.300.
Kanegae, Hirozoh: *See*—
Adachi, Etsushi; Adachi, Hiroshi; Mochizuki, Hiroshi; and Kanegae, Hirozoh, 5,180,691, Cl. 437-235.000.
Kaneko, Akitami: *See*—
Kawada, Noriyuki; Morii, Shigeki; Nakashima, Motomi; Yamada, Jin; and Kaneko, Akitami, 5,180,048, Cl. 198-619.000.
Kaneko, Yoichi: *See*—
Kaise, Atsushi; Hirohara, Naoya; Kasahara, Hiroshi; Wakou, Iichi; and Kaneko, Yoichi, 5,181,042, Cl. 343-700.0MS.
Kang, Cheol S.; and Lee, Jin H., to Hyundai Electronics Industries Co., Ltd. Circuit of eliminating motional vector remaining. 5,181,109, Cl. 358-105.000.
Kantech Industries, Inc.: *See*—
Richardson, Larry V., 5,179,893, Cl. 100-98.00R.
Kantter, William J.: *See*—
Siegel, William J.; Abbagnaro, Louis A.; and Kantter, William J., 5,180,440, Cl. 136-230.000.
Kanzaki, Takashi, to Casio Computer Co., Ltd. Analog electronic timepiece. 5,181,190, Cl. 368-76.000.
Kaplan, Ralph B.: *See*—
Fernandez, Richard E.; and Kaplan, Ralph B., 5,180,860, Cl. 570-157.000.
Kaplan, Vladimir, to AMSTED Industries Inc. Apparatus and method for fluid distribution in a cooling tower. 5,180,528, Cl. 261-111.000.
Kardorff, Uwe: *See*—
Leyendecker, Joachim; Neubauer, Hans-Juergen; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; and Krieg, Wolfgang, 5,180,727, Cl. 514-255.000.
Karidis, John P.; McVicker, Gerard; and Pawletko, Joseph P., to International Business Machines Corporation. Positioning apparatus. 5,180,955, Cl. 318-568.100.
Karl Lautenschlager GmbH & Co. KG: *See*—
Lautenschlager, Horst, 5,180,217, Cl. 312-334.700.
Karl Widmann Schweissmaschinen GmbH: *See*—
Widmann, Werner, 5,180,461, Cl. 156-216.000.
Kasahara, Hiroshi: *See*—
Kaise, Atsushi; Hirohara, Naoya; Kasahara, Hiroshi; Wakou, Iichi; and Kaneko, Yoichi, 5,181,042, Cl. 343-700.0MS.
Kasai, Fumio: *See*—
Yoshino, Syoichi; Izaki, Hiroshi; Yoshino, Masanori; Kasai, Fumio; Tokunaga, Yosimitu; and Isshiki, Naotsugu, 5,180,539, Cl. 266-202.000.
Kasai, Masaji: *See*—
Arai, Hitoshi; Kono, Motomichi; Kasai, Masaji; Gomi, Katsushige; and Ashizawa, adashi, 5,180,825, Cl. 544-318.000.
Kasai, Minoru; and Nakamura, Minoru, to Hitec Co., Ltd. Apparatus for manufacturing sausages of the like. 5,180,327, Cl. 452-47.000.
Kashiba, Takashi: *See*—
Sugihara, Yasuo; Komatsu, Toshio; Kashiba, Takashi; Hatakeyama, Hidetoshi; and Takeuchi, Teruo, 5,180,518, Cl. 252-188.280.
Kashiwagi, Hiroki: *See*—
Kamoshita, Ryuji; Kashiwagi, Hiroki; and Takimoto, Koji, 5,180,779, Cl. 525-87.000.
Kashiwagi, Nobuyoshi: *See*—
Sasaki, Masatomi; and Kashiwagi, Nobuyoshi, 5,180,789, Cl. 525-326.300.
Kasinski, Jeffrey J.: *See*—
Burnham, Ralph L.; Kasinski, Jeffrey J.; and Marshall, Larry R., 5,181,211, Cl. 372-21.000.
Kasman, Alexander, to Telefonaktienbolaget L M Ericsson. Method and apparatus for error tracking in a multitasking environment. 5,181,204, Cl. 371-16.500.
Katagi, Takashi: *See*—
Inoue, Masato; Tajima, Minoru; Orime, Nobutake; and Katagi, Takashi, 5,181,040, Cl. 342-149.000.
Katayama, Yasuyuki; Ishimoto, Yasuhiko; Horide, Fumio; Tsuda, Shigenori; and Nishioka, Fumio, to Sumitomo Chemical Company, Limited. Water dispersible granules. 5,180,420, Cl. 504-116.000.
Kato, Fumiaki: *See*—
Hirota, Katsuaki; Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; and Kato, Fumiaki, 5,181,119, Cl. 358-227.000.
Kato, Kazuharu: *See*—
Murakami, Tadaki; Shirazawa, Takashi; and Kato, Kazuharu, 5,180,532, Cl. 264-60.000.
Kato, Masayuki; Nishino, Shigetaka; Ito, Kiyotaka; and Takasugi, Hisashi, to Fujisawa Pharmaceutical Company, Ltd. Pyrimidoindole derivatives and processes for preparation thereof. 5,180,728, Cl. 514-267.000.
Kato, Toshio; Miyazawa, Yorikatu; Shibazaki, Osamu; and Goda, Yoshihiko, to Konica Corporation. Film magazine forming apparatus. 5,179,855, Cl. 72-401.000.
Katoh, Tetsuya: *See*—
Kubota, Koichi; Katoh, Tetsuya; Hirata, Masayuki; and Hayashi, Kazuya, 5,180,402, Cl. 8-490.000.
Katohno, Nobuo; and Shibata, Yoshihiro, to Hitachi, Ltd. Video tape recorder and/or reproducer. 5,180,117, Cl. 242-189.000.
Katou, Susumu; and Nakamura, Kanji, to Kumiai Chemical Industry Co., Ltd. Herbicidal composition comprising a liquid thiocarbamate herbicide, a solid herbicide, surfactant, and dry process silicic acid. 5,180,416, Cl. 504-136.000.
Katsumata, Kenji; Hirahata, Shigeru; Sugiyama, Masato; Matono, Takaaki; Ishikura, Kazuo; Suzuki, Sunao; and Kaizaki, Kazuhiro, to Hitachi, Ltd.; and Hitachi Video Engineering Inc. Video signal processing circuit capable of enlarging and displaying a picture. 5,181,110, Cl. 358-140.000.
Katsumata, Masao; Momata, Kazuhiro; Adachi, Kazuyoshi; Takeura, Tooru; Kitada, Masahiro; Kamo, Yoshihisa; and Yoshimatsu, Toshikane, to Hitachi, Ltd. Magnetic recording/reproducing head assembly. 5,181,149, Cl. 360-119.000.
Katsumoto, Masayuki: *See*—
Chiba, Katsuyoshi; Katsumoto, Masayuki; Uesaka, Yasutaro; Fukke, Hajime; Ishihara, Heigo; Matsuyama, Iwao; Kodama, Naoki; Inoue, Hitoshi; and Terada, Yoshiharu, 5,180,608, Cl. 427-560.000.
Fukke, Hajime; Akagi, Motoo; Matsuyama, Iwao; Katsumoto, Masayuki; Inoue, Hitoshi; Kodama, Naoki; and Uesaka, Yasutaro, 5,180,616, Cl. 428-64.000.
Kattwinkel, Hans H.; and Kattwinkel, Marcus. Watercraft. 5,179,906, Cl. 114-270.000.
Kattwinkel, Marcus: *See*—
Kattwinkel, Hans H.; and Kattwinkel, Marcus, 5,179,906, Cl. 114-270.000.
Katz, Egon: *See*—
Muller, Manfred; Henseler, Wolfgang; Katz, Egon; Bossenmaier, Alban; and Hamm, Dietrich, 5,180,187, Cl. 280-732.000.
Katz, Leon: *See*—
Park, John J.; Katz, Leon; and Gaylord, Norman G., 5,180,751, Cl. 521-51.000.

Kavehrad, Mohsen; and Irshid, Mansour I., to University of Ottawa, The. Optical homodyne DPSK receiver with optical amplifier. 5,181,136, Cl. 359-190.000.

Kawada, Noriyuki; Morii, Shigeki; Nakashima, Motomi; Yamada, Jin; and Kaneko, Akitami, to Mitsubishi Jukogyo Kabushiki Kaisha. Magnetic levitating transportation system. 5,180,048, Cl. 198-619.000.

Kawaguchi, Hitoshi: *See*—
Shinokura, Kiichiro; and Kawaguchi, Hitoshi, 5,181,213, Cl. 372-30.000.

Kawakami, Hiroshi, to Sony Corporation. Apparatus for muting noise resulting from reproducing of a PCM audio signal recorded in an extension of a slant track containing a recorded video signal. 5,181,125, Cl. 358-336.000.

Kawakami, Shin: *See*—
Seki, Kameharu; Kawakami, Shin; and Kubo, Isamu, 5,180,465, Cl. 156-640.000.

Kawamoto, Mutsumi: *See*—
Yamashita, Mitugu; Kawamoto, Mutsumi; and Inagaki, Hidemitsu, 5,180,180, Cl. 280-96.000.

Kawamura, Norio: *See*—
Harada, Chikao; Kawamura, Norio; Nakashima, Ryuji; Takahashi, Arihiro; Yamazaki, Toshimasa; Yasui, Masanobu; and Kondo, Tatsushi, 5,179,956, Cl. 128-672.000.

Kawamura, Youji: *See*—
Narishima, Ryousuke; Ogiri, Tetsuo; Kawamura, Youji; and Iwakawa, Hiroaki, 5,180,257, Cl. 406-173.000.

Kawanishi, Hidenori: *See*—
Yamamoto, Osamu; and Kawanishi, Hidenori, 5,180,685, Cl. 437-129.000.

Kawano, Shigenori: *See*—
Andoh, Masakazu; and Kawano, Shigenori, 5,180,975, Cl. 324-158.00F.

Kawasaki, Masahiro; Takahashi, Hiroyuki; and Iwamoto, Shigeru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera system. 5,181,061, Cl. 354-400.000.

Kawasaki Steel Corp.: *See*—
Masui, Susumu; Sakata, Kei; and Togashi, Fusao, 5,180,449, Cl. 148-533.000.

Kawashima, Yoshiaki; Iwamoto, Taro; and Tejima, Kikuo, to Kawashima, Yoshiaki; and Showa Yakuhin Kako Co., Ltd. Colloid solution for preparing suspension having both fluidity and suspensibility. 5,180,522, Cl. 252-311.000.

Kawauchi, Masato: *See*—
Abe, Shizuo; Tokoro, Masayoshi; and Kawauchi, Masato, 5,179,915, Cl. 123-41.790.

Kawaura, Hisao, to NEC Corporation. Solid state image sensor having high charge transfer efficiency. 5,181,093, Cl. 257-223.000.

Kazumi, Jiro, to Canon Kabushiki Kaisha. Information reading apparatus, camera capable of exchanging signals with the information reading apparatus, and memory medium. 5,181,062, Cl. 354-412.000.

Kazuo, Yoshimura; and Satoh, Ryo, to Takata Corporation. Acceleration sensor with magnetically influenced rotary member. 5,180,892, Cl. 200-61.45M.

KB Alloys, Inc.: *See*—
Sigworth, Geoffrey K.; and Guzowski, Matthew M., 5,180,447, Cl. 148-437.000.

Kearney, Michael R.: *See*—
Piccolo, Joseph R., Sr.; Swilling, William H., Jr.; Kearney, Michael R.; and Mosher, Douglas E., 5,180,225, Cl. 366-147.000.

Keel, Beat G.: *See*—
Yan, Ying D.; Bortins, John; Keel, Beat G.; and Amin, Nurul, 5,181,152, Cl. 360-126.000.

Keeler, R. Norris, to Kaman Aerospace Corporation. Optical underwater communications systems employing tunable and fixed frequency laser transmitters. 5,181,135, Cl. 359-141.000.

Keilhauer, Gerhard: *See*—
Doerper, Thomas; Moeller, Achim; Hillen, Heinz; Keilhauer, Gerhard; Emling, Franz; and Daum, Lothar, 5,180,811, Cl. 530-351.000.

Kelsey-Hayes Company: *See*—
Evans, Anthony C., 5,180,037, Cl. 188-70.00R.

Kemna, Andreas H.: *See*—
Niessner, Manfred; Beck, Juergen; Hartmann, Heinrich; Kemna, Andreas H.; and Wickel, Stefan, 5,180,804, Cl. 528-500.000.

Kennedy, Gerald R., Jr., to GraviTech, Inc. Method and device for maintaining or restoring normal lumbar curvature. 5,180,386, Cl. 606-240.000.

Kennedy, William J.: *See*—
Kessler, William F.; Clutch, Dennis R.; and Kennedy, William J., 5,180,618, Cl. 428-100.000.

Kenney Manufacturing Company: *See*—
McMichael, Dannie L., 5,180,130, Cl. 248-251.000.

Kent, Scott E., to General Motors Corporation. Pulsating oil injector for radial refrigerant compressor. 5,180,291, Cl. 417-273.000.

Kersey, Joe B.; and Davis, Gail F., to Halliburton Company. Damage-resistant containment device. 5,180,190, Cl. 280-838.000.

Kershaw, John: *See*—
Hutton, Les; and Kershaw, John, 5,180,046, Cl. 194-319.000.

Kertis, Robert A., to National Semiconductor Corporation. Short circuit detector circuit for memory arrays. 5,181,205, Cl. 371-21.100.

Kessell, Steven M.: *See*—
Barcza, William K.; and Kessell, Steven M., 5,179,832, Cl. 60-261.000.

Kessler, William F.; Clutch, Dennis R.; and Kennedy, William J., to Velcro Industries B.V. Separable fasteners for attachment to other objects. 5,180,618, Cl. 428-100.000.

Keutgen, Peter: *See*—
Bruckner, Raimund; Keutgen, Peter; and Donner, Andreas, 5,180,536, Cl. 266-44.000.

Key-Tech, Inc.: *See*—
Durand, David, 5,180,513, Cl. 252-62.550.

Keyes, Tyrone M.: *See*—
Conaway, Brian J.; and Keyes, Tyrone M., 5,180,067, Cl. 211-119.000.

Khan, Mohammad A.; and Hoang, Minh Q., to Becton, Dickinson and Company. Stable iodophor in polyurethane foam. 5,180,061, Cl. 206-570.000.

Khasanov, Robert M., to Lasell, Steven M. Magnesia concrete. 5,180,429, Cl. 106-685.000.

Kidwell, Charles E.: *See*—
Rada, Mark Z.; Willis, John W.; Eade, John A.; and Kidwell, Charles E., 5,180,050, Cl. 200-329.000.

Kief, Thomas E. Lock holding device. 5,179,848, Cl. 70-51.000.

Kiku, Kazuomi: *See*—
Shiomi, Kazuyuki; Tanaka, Mitsuharu; Kiku, Kazuomi; and Saito, Akihisa, 5,180,319, Cl. 440-52.000.

Kikuchi, Akihiro: *See*—
Hirota, Katsuaki; Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; and Kato, Fumiaki, 5,181,119, Cl. 358-227.000.

Kikuchi, Masaharu: *See*—
Asai, Kazuo; and Kikuchi, Masaharu, 5,181,142, Cl. 359-581.000.

Kikuiri, Nobutaka: *See*—
Uchida, Norio; and Kikuiri, Nobutaka, 5,179,863, Cl. 73-865.800.

Kikumoto, Nobuo; and Hayashi, Mineo, to Mitsubishi Materials Corporation. Copper smelting process. 5,180,422, Cl. 75-644.000.

Kim, Jason S., to AST Research, Inc. Electronic keyboard template. 5,181,029, Cl. 241-20.000.

Kim, Jong-woo; and Jang, Ki-sun, to Samsung Electronics Co., Ltd. Thermal transfer printer. 5,180,233, Cl. 400-120.000.

Kimberly-Clark Corporation: *See*—
Sauer, Robert D.; and Jamal, Mustafa M., 5,180,471, Cl. 162-112.000.

Kimura, Atsushi: *See*—
Seki, Hiroyuki; and Kimura, Atsushi, 5,180,941, Cl. 310-323.000.

Kimura, Hiroshi: *See*—
Wakamiya, Wataru; Tanaka, Yoshinori; Eimori, Takahisa; Ozaki, Hiroji; Kimura, Hiroshi; and Satoh, Shinichi, 5,180,683, Cl. 437-47.000.

Kimura, Kei, to Fuji Photo Film Co., Ltd. Method of correcting image signal. 5,181,118, Cl. 358-213.160.

Kimura, Masao: *See*—
Yamaoka, Ikuro; and Kimura, Masao, 5,180,535, Cl. 264-328.160.

Kimura, Tadao; Takahashi, Toshihide; and Shimizu, Kazuo, to Sanyo-Kokusaku Pulp Co., Ltd. Method of producing chlorinated polyolefin. 5,180,791, Cl. 525-358.000.

Kimura, Yoshihiko: *See*—
Ozato, Yukinori; Tamura, Nobuhiko; Masumori, Hiroaki; Yamamoto, Michihiro; Kojima, Atsuyuki; Nishikaku, Fumio; and Kimura, Yoshihiko, 5,180,731, Cl. 514-364.000.

Kimura, Yoshikazu; and Teuboi, Hideo, to Ebara Corporation. Spiral groove face seal. 5,180,173, Cl. 277-96.100.

Kingsbury, Ronald L., to Norfolk Southern Railway Co. Brake pipe continuity valve system. 5,180,213, Cl. 303-86.000.

Kinoshita, Shinitsu, to Hitachi Maxell, Ltd. Metal mold for resin substrate for an optical recording medium. 5,180,595, Cl. 425-556.000.

Kioritz Corporation: *See*—
Nagashima, Akira, 5,179,785, Cl. 30-382.000.

Kipfelsberger, Christian: *See*—
Heier, Manfred; Brudermann, Uwe; and Kipfelsberger, Christian, 5,180,621, Cl. 428-138.000.

Kirby, Michael A., Sr.: *See*—
Adams, John M.; Chance, Christopher N.; DeBlasio, James A.; Evers, Donald H.; Kirby, Michael A., Sr.; Newsome, Reginald W.; and Talley, Robert E., 5,180,056, Cl. 206-256.000.
Chance, Christopher N.; DeBlasio, James A.; Evers, Donald H.; Harris, William C., Jr.; Kirby, Michael A., Sr.; Newsome, Reginald W.; and Talley, Robert E., 5,180,055, Cl. 206-256.000.

Kirstein, Lothar, to Robert Bosch GmbH. Hydraulic dual-circuit brake system with anti-skid and traction control. 5,180,216, Cl. 303-113.200.

Kirstein, Lothar: *See*—
Bernhardt, Wolfgang; Holzmann, Roland; Schmidt, Guenther; Kirstein, Lothar; and Wetzel, Gerhard, 5,180,215, Cl. 303-113.200.

Kishimoto, Fumitaka: *See*—
Gomi, Hideyuki; Hozumi, Tatsunobu; Hattori, Shizuo; Tagawa, Chiaki; Kishimoto, Fumitaka; and Bjorck, Lars, 5,180,810, Cl. 530-350.000.
Nishizawa, Kanji; Mitsuda, Satoshi; Komaki, Ryohei; Sugimoto, Masako; Sugiki, Chiaki; Ogami, Yasutaka; Sonoda, Kazumi; and Kishimoto, Fumitaka, 5,180,671, Cl. 435-136.000.

Kishimoto, Shoji; Marui, Shogo; and Fujita, Takeshi, to Takeda Chemical Industries, Ltd. Cyclohexanol derivatives, production and use thereof. 5,180,735, Cl. 514-443.000.

Kishimoto, Shoji; and Fujita, Takeshi, to Takeda Chemical Industries. Fumagillol derivatives and pharmaceutical compositions thereof. 5,180,738, Cl. 514-475.000.

Kishina, Yoshiyuki: *See*—
Sukeyasu, Ryuzo; Kishina, Yoshiyuki; Okawa, Masao; Horigome, Naoyuki; and Ito, Yasuhito, 5,179,819, Cl. 53-442.000.

Kisi, Hirosi: *See*—
Chazono, Hirokazu; Honda, Mutsumi; Kisi, Hirosi; Saito, Hirosi; and Shizuno, Hisamitsu, 5,181,157, Cl. 361-321.000.

Kisida, Hirosi: *See*—
Tomioka, Hiroki; Sakamoto, Noriyasu; Umeda, Kimitoshi; Fujimoto, Hiroaki; Ishiwatari, Takao; and Kisida, Hirosi, 5,180,732, Cl. 514-396.000.

Kistler Instrumente AG: *See*—
Sonderegger, Hans; Kuratle, Rolf; and Wolfer, Peter, 5,179,857, Cl. 73-117.300.

Kitada, Masahiro: *See*—
Katsumata, Masao; Momata, Kazuhiro; Adachi, Kazuyoshi; Takeura, Tooru; Kitada, Masahiro; Kamo, Yoshihisa; and Yoshimatsu, Toshikane, 5,181,149, Cl. 360-119.000.

Kitagawa, Yoshinori: *See*—
Shinmen, Yoshifumi; Akimoto, Kengo; Asami, Sumio; Suwa, Yoshihide; Kitagawa, Yoshinori; Sugano, Michihiro; Yamada, Hideaki; and Shimizu, Sakayu, 5,180,588, Cl. 424-439.000.

Kitahara, Satoshi; Koyama, Shuji; and Shiozaki, Tsugio, to Tokyo Electric Co., Ltd. Transfer printer. 5,180,236, Cl. 400-175.000.

Kitami, Takayuki: *See*—
Ono, Katsuhiro; Anno, Hidero; Sugiura, Hiroyuki; and Kitami, Takayuki, 5,181,235, Cl. 378-133.000.

Kitayama, Minoru; Morifusa, Harumi; and Kondoh, Katsumi, to Chugoku Marine Paints, Ltd. Primer compositions for pretreatment or fitting of coatings and processes for treating them. 5,180,776, Cl. 525-64.000.

Kiyohara, Kazuto; Araki, Hiromitsu; Yamazaki, Toshiaki; and Harada, Ichiya, to Konica Corporation. White polyester composition and support for photography. 5,180,658, Cl. 430-533.000.

Klara, Edward M.: *See*—
Berry, Waldo A., Jr.; and Klara, Edward M., 5,180,875, Cl. 42-101.000.

Klaue, Kaj, to Laboratorium fur experimentelle Chirurgie. Self-locking bone-shaft part. 5,180,395, Cl. 623-23.000.

Kleefeld, Joseph: *See*—
Berger, Josef; Mick, Doron; and Kleefeld, Joseph, 5,181,214, Cl. 372-34.000.

Klimczak, Gary W.: *See*—
Rostoker, William, deceased; Rostoker, Gareth; Bonini, Julius J.; and Klimczak, Gary W., 5,180,421, Cl. 75-414.000.

Klinger, Dietmar. Optoelectronic measurement arrangement. 5,181,079, Cl. 356-375.000.

Klose, Heinrich, to Jenoptik Jena GmbH. Device for adjustably setting up an aerial photograph measuring chamber. 5,180,127, Cl. 248-188.300.

Knifton, John F.: *See*—
Sanderson, John R.; and Knifton, John F., 5,180,864, Cl. 585-10.000.

Knight, Donnie: *See*—
Smith, Darrel L.; and Knight, Donnie, 5,179,758, Cl. 15-250.003.

Knol, James A.: *See*—
Ensminger, William D.; Knol, James A.; and Andrews, James C., 5,180,365, Cl. 604-93.000.

Knowles, Steven M.: *See*—
Allread, Alan R.; Chichester, Dennis B.; Rogers, Russell L.; and Knowles, Steven M., 5,180,194, Cl. 285-166.000.

Knudson, Mark B., to Inomet, Inc. Blood constituent measurement. 5,179,951, Cl. 128-633.000.

Ko, Kwang-Ok; and Park, Jong-Ho, to Samsung Electronics Co., Ltd. Method for growing a high-melting-point metal film. 5,180,468, Cl. 156-644.000.

Kobayashi, Hiroaki; Koboshi, Shigeharu; Kurematsu, Masayuki; and Ishikawa, Masao, to Konica Corporation. Method for processing silver halide color photographic light-sensitive materials and the bleach-fixer applicable thereto. 5,180,656, Cl. 430-393.000.

Kobayashi, Hiroki: *See*—
Nakajima, Satoshi; Mochizuki, Kouichi; Kobayashi, Hiroki; and Kohno, Yuji, 5,181,071, Cl. 355-203.000.

Kobayashi, Hiroshi: *See*—
Asano, Nobuhiro; and Kobayashi, Hiroshi, 5,179,861, Cl. 73-726.000.

Kobayashi, Kiyonori: *See*—
Nakane, Mototaka; and Kobayashi, Kiyonori, 5,180,334, Cl. 464-35.000.

Kobayashi, Masayoshi: *See*—
Usagawa, Toshiyuki; Imamura, Yoshinori; Okuhira, Hidekazu; Goto, Shigeo; Kobayashi, Masayoshi; and Takatani, Shinichiro, 5,181,087, Cl. 257-194.000.

Kobayashi, Ryoji: *See*—
Tanaka, Hiroshi; and Kobayashi, Ryoji, 5,180,252, Cl. 405-144.000.

Kobayashi, Taiji: *See*—
Tsurutani, Kazushi; Hosogai, Daijiro; Kokubo, Kakuro; Kobayashi, Taiji; Higashimoto, Noboru; Endoh, Masami; Namiyama, Kazuyoshi; and Yoneda, Makoto, 5,179,923, Cl. 123-435.000.

Kobayashi, Takashi: *See*—
Noguchi, Kazuhiro; Ogino, Shigeru; and Kobayashi, Takashi, 5,181,056, Cl. 354-70.000.

Kobayashi, Yoshinori: *See*—
Era, Susumu; Matsumoto, Toshio; Kobayashi, Yoshinori; Shitara, Masashi; Hattori, Isamu; and Nomura, Yoshihiro, 5,180,786, Cl. 525-281.000.

Kobayshi, Takeo; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electronically controlled camera. 5,181,060, Cl. 354-238.100.

Koboshi, Shigeharu: *See*—
Kobayashi, Hiroaki; Koboshi, Shigeharu; Kurematsu, Masayuki; and Ishikawa, Masao, 5,180,656, Cl. 430-393.000.

Kodama, Hirokazu: *See*—
Okamoto, Mitsuo; Kodama, Hirokazu; and Minamino, Kouji, 5,181,160, Cl. 363-97.000.

Kodama, Naoki: *See*—
Chiba, Katsuyoshi; Katsumoto, Masayuki; Uesaka, Yasutaro; Fukke, Hajime; Ishihara, Heigo; Matsuyama, Iwao; Kodama, Naoki; Inoue, Hitoshi; and Terada, Yoshiharu, 5,180,608, Cl. 427-560.000.
Fukke, Hajime; Akagi, Motoo; Matsuyama, Iwao; Katsumoto, Masayuki; Inoue, Hitoshi; Kodama, Naoki; and Uesaka, Yasutaro, 5,180,616, Cl. 428-64.000.

Kodama, Shoichi: *See*—
Sakaya, Kazuhiro; and Kodama, Shoichi, 5,180,273, Cl. 414-404.000.

Koei Chemical Co., Ltd.: *See*—
Takada, Tetuzi; and Gotoh, Nobuo, 5,180,792, Cl. 525-423.000.

Koenig & Bauer Aktiengesellschaft: *See*—
Schwitzky, Volkmar R., 5,179,900, Cl. 101-240.000.

Koester, Charles J.: *See*—
Donn, Anthony; and Koester, Charles J., 5,180,389, Cl. 623-6.000.

Koga, Hirohisa, to Sony Corporation. Apparatus for digitally recording and reproducing video and audio signals in skewed tracks on a record tape. 5,181,146, Cl. 360-19.100.

Kogure, Masahiko, to Nomura Micro Science Co., Ltd. Method for vacuum deaeration. 5,180,403, Cl. 55-53.000.

Kohara, Hidekatsu: *See*—
Miyabe, Masanori; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,180,653, Cl. 430-296.000.

Kohashi, Takashi: *See*—
Hirota, Katsuaki; Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; and Kato, Fumiaki, 5,181,119, Cl. 358-227.000.

Kohle, Hans-Juergen: *See*—
Birkhan, Horst; Kohle, Hans-Juergen; Weigand, Joachim; and Wehner, Winfried, 5,180,508, Cl. 252-8.800.

Kohno, Yuji: *See*—
Nakajima, Satoshi; Mochizuki, Kouichi; Kobayashi, Hiroki; and Kohno, Yuji, 5,181,071, Cl. 355-203.000.

Koide, Jun, to Canon Kabushiki Kaisha. Light scanning apparatus. 5,181,137, Cl. 359-217.000.

Koito Manufacturing Co., Ltd.: *See*—
Ohshio, Hirohiko, 5,180,218, Cl. 362-61.000.

Koivunen, Erkki A.: *See*—
Vahabzadeh, Hamid; and Koivunen, Erkki A., 5,180,340, Cl. 474-111.000.
Vahabzadeh, Hamid; and Koivunen, Erkki A., 5,180,341, Cl. 474-111.000.

Koizumi, Noboru: *See*—
Nemoto, Mitsugu; Koizumi, Noboru; and Okazaki, Shigeru, 5,181,074, Cl. 355-245.000.

Kojima, Atsuyuki: *See*—
Ozato, Yukinori; Tamura, Nobuhiko; Masumori, Hiroaki; Yamamoto, Michihiro; Kojima, Atsuyuki; Nishikaku, Fumio; and Kimura, Yoshihiko, 5,180,731, Cl. 514-364.000.

Kojima, Yutaka; and Omori, Takashi, to Jujo Paper Co., Ltd. Ink jet recording paper. 5,180,624, Cl. 428-211.000.

Kokubo, Kakuro: *See*—
Tsurutani, Kazushi; Hosogai, Daijiro; Kokubo, Kakuro; Kobayashi, Taiji; Higashimoto, Noboru; Endoh, Masami; Namiyama, Kazuyoshi; and Yoneda, Makoto, 5,179,923, Cl. 123-435.000.

Kokubun, Hitoshi, to Oki Electric Industry Co., Ltd. Voltage measuring circuit. 5,180,929, Cl. 307-350.000.

Kokusai Electric Co., Ltd.: *See*—
Urabe, Kenzo; and Akaiwa, Yoshihiko, 5,181,182, Cl. 364-718.000.

Koleas, Richard D. In situ rejuvenation of aged and cracked asphalt pavement. 5,180,428, Cl. 106-277.000.

Komag, Inc.: *See*—
Yamashita, Tsutomu T.; Nguyen, Phuong; and Chen, Tu, 5,180,640, Cl. 428-611.000.

Komaki, Ryohei: *See*—
Nishizawa, Kanji; Mitsuda, Satoshi; Komaki, Ryohei; Sugimoto, Masako; Sugiki, Chiaki; Ogami, Yasutaka; Sonoda, Kazumi; and Kishimoto, Fumitaka, 5,180,671, Cl. 435-136.000.

Komatsu, Satoru, to Honda Giken Kogyo Kabushiki Kaisha. FM radar system. 5,181,037, Cl. 342-70.000.

Komatsu, Takashi: *See*—
Ishibashi, Satoru; Nakamura, Kyuzo; Higuchi, Yasushi; Komatsu, Takashi; Murata, Yuzo; and Ota, Yoshifumi, 5,180,476, Cl. 204-192.290.

Komatsu, Toshio: *See*—
Sugihara, Yasuo; Komatsu, Toshio; Kashiba, Takashi; Hatakeyama, Hidetoshi; and Takeuchi, Teruo, 5,180,518, Cl. 252-188.280.

Komori Currency Technology UK Ltd.: *See*—
Rendell, Michael P., 5,180,612, Cl. 427-372.200.

Komori, Mikio; Adachi, Kazuyu; and Sato, Shuichi, to Japan Tobacco Inc. Apparatus for forming micro-holes on cylindrical objects. 5,179,965, Cl. 131-281.000.

Konami Kogyo Kabushiki Kaisha: *See*—
Ooishi, Toshimitsu, 5,181,122, Cl. 358-238.000.

Kondo, Kenshi, to Nihon Den-Netsu Keiki Co., Ltd. Method and apparatus for reflow-soldering of printed circuit boards. 5,180,096, Cl. 228-180.100.

Kondo, Tatsushi: *See*—
Harada, Chikao; Kawamura, Norio; Nakashima, Ryuji; Takahashi, Arihiro; Yamazaki, Toshimasa; Yasui, Masanobu; and Kondo, Tatsushi, 5,179,956, Cl. 128-672.000.

Kondo, Toshiharu: *See*—
Hirota, Katsuaki; Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; and Kato, Fumiaki, 5,181,119, Cl. 358-227.000.

Kondoh, Harufusa: *See*—
Hayashi, Isamu; and Kondoh, Harufusa, 5,180,995, Cl. 331-57.000.

Kondoh, Katsumi: *See*—
Kitayama, Minoru; Morifusa, Harumi; and Kondoh, Katsumi, 5,180,776, Cl. 525-64.000.

Konica Corporation: *See*—
Fukazawa, Fumie; Irie, Yasushi; Shimazaki, Hiroshi; Yabuuchi, Katuya; and Shimba, Satoru, 5,180,657, Cl. 430-503.000.
Kato, Toshio; Miyazawa, Yorikatu; Shibazaki, Osamu; and Goda, Yoshihiko, 5,179,855, Cl. 72-401.000.
Kiyohara, Kazuto; Araki, Hiromitsu; Yamazaki, Toshiaki; and Harada, Ichiya, 5,180,658, Cl. 430-533.000.
Kobayashi, Hiroaki; Koboshi, Shigeharu; Kurematsu, Masayuki; and Ishikawa, Masao, 5,180,656, Cl. 430-393.000.
Murai, Kazuhiro; and Takada, Shun, 5,180,659, Cl. 430-623.000.
Nemoto, Mitsugu; Koizumi, Noboru; and Okazaki, Shigeru, 5,181,074, Cl. 355-245.000.

Koninklijke Ptt Nederland N.V.: *See*—
Gerardus, Johannes J.; and Doeksen, Doeke K., 5,181,262, Cl. 385-16.000.

Konno, Toshio: *See*—
Ohyama, Minoru; Yamazaki, Tetsuhiro; Inoue, Hiroshi; and Konno, Toshio, 5,180,909, Cl. 250-216.000.

Kono, Motomichi: *See*—
Arai, Hitoshi; Kono, Motomichi; Kasai, Masaji; Gomi, Katsushige; and Ashizawa, adashi, 5,180,825, Cl. 544-318.000.

Konomi, Toshiaki: *See*—
Hokazono, Yuichi; and Konomi, Toshiaki, 5,179,917, Cl. 123-52.0MF.

Kostos, Stavros B.; and Urbanski, Jeffrey C., to Datascope Corporation. Procedure and balloon catheter system for relieving arterial or veinal restrictions without exchanging balloon catheters. 5,180,367, Cl. 604-101.000.

Koppelhuber, Franz: *See*—
Hockh, Jurgen; and Koppelhuber, Franz, 5,180,438, Cl. 134-21.000.

Koppy Corporation: *See*—
Walker, Herman B., 5,180,043, Cl. 192-70.200.

Korsen, David W. Magnetic pick up bar for vacuum cleaners. 5,179,756, Cl. 15-246.000.

Kosaka, Masahisa: *See*—
Sato, Koji; Suzuki, Tokio; Kamiya, Hajime; Nakamura, Kimio; Kosaka, Masahisa; and Ohsora, Tetsuo, 5,181,141, Cl. 359-580.000.

Koul, Maharaj K.; Whitaker, Franklin T.; and Paul, Richard W., to Atlantic Metals Corporation. Process for insulating molten steel during continuous casting. 5,179,997, Cl. 164-473.000.

Kouya, Masahiro: *See*—
Harazoe, Hirofumi; Shiromoto, Hiroyoshi; Yagi, Kazuo; and Kouya, Masahiro, 5,180,636, Cl. 428-373.000.

Kouzel, Richard L.; Penn, Aubery W.; Jensen, Brian D.; and Dicke, Paul A., to Caterpillar Inc. Dual fan cooling system. 5,180,003, Cl. 165-121.000.

Kowis, Fred. Wheel alignment device. 5,179,784, Cl. 33-203.180.

Koyama, Hiroshi: *See*—
Sugiyama, Ikuo; Ishibashi, Kazuhisa; Takakusaki, Nobuyuki; Maruhashi, Yoshitsugu; Nishimura, Yasushi; Koyama, Hiroshi; Iida, Setsuko; and Sato, Koji, 5,180,893, Cl. 219-10.430.

Koyama, Shuji: *See*—
Kitahara, Satoshi; Koyama, Shuji; and Shiozaki, Tsugio, 5,180,236, Cl. 400-175.000.

Koyo Seiko Co., Ltd.: *See*—
Ueno, Hiroshi; Hatabu, Shoji; Kumata, Etsuko; and Adachi, Takehiro, 5,180,231, Cl. 384-527.000.

Kraft General Foods, Inc.: *See*—
Crane, Lori A.; Hynes, John T.; Guth, Jules H.; and Strandholm, John J., 5,180,604, Cl. 426-582.000.

Kranefeld, Andreas; Temburg, Josef; and Marom, Abi, to Trutzschler GmbH & Co. KG. Method and apparatus for severing ties and wrappers of textile fiber bales. 5,179,878, Cl. 83-13.000.

Kratos Analytical Limited: *See*—
Davis, Stephen C.; and Evans, Sydney, 5,180,914, Cl. 250-287.000.

Krause, Frank: *See*—
Heidel, Klaus; Krause, Frank; and Hofmann, Peter, 5,180,800, Cl. 527-300.000.

Krebs Engineers: *See*—
Grieve, Donald F., 5,180,493, Cl. 210-512.300.

Krieg, Wolfgang: *See*—
Leyendecker, Joachim; Neubauer, Hans-Juergen; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; and Krieg, Wolfgang, 5,180,727, Cl. 514-255.000.

Krings, Josef, to Teska Verbautechnik GmbH. Support device for lining a ditch. 5,180,256, Cl. 405-282.000.

Krummell, John V. R.; and Davison, Kenneth E., to Advance Storage Products. Four-deep push-back warehouse storage rack system. 5,180,069, Cl. 211-151.000.

Krupp Industrietechnik GmbH: *See*—
Wiedeck, Hans N., 5,179,751, Cl. 14-2.400.

Krupp Koppers GmbH: *See*—
Skatulla, Luzian; Vollmer, Hans-Jurgen; and Schneider, Hans-Christoph, 5,180,474, Cl. 203-84.000.

Krzyzanowski, Robert V., to Honeywell Inc. Programmable digital out-of-lock detector. 5,180,933, Cl. 307-514.000.

Kuan, Chen, to Chi Chang Enterprises Co., Ltd. Oily smoke purifying apparatus of central processing system type. 5,180,405, Cl. 55-227.000.

Kubersky, Hans-Peter: *See*—
Fleckenstein, Theo; Goebel, Gerd; Carduck, Franz-Josef; Demmering, Guenther; and Kubersky, Hans-Peter, 5,180,858, Cl. 568-885.000.

Kubo, Isamu: *See*—
Seki, Kameharu; Kawakami, Shin; and Kubo, Isamu, 5,180,465, Cl. 156-640.000.

Kubota Corporation: *See*—
Yoshino, Syoichi; Izaki, Hiroshi; Yoshino, Masanori; Kasai, Fumio; Tokunaga, Yosimitu; and Ishiki, Naotsugu, 5,180,539, Cl. 266-202.000.

Kubota, Koichi; Katoh, Tetsuya; Hirata, Masayuki; and Hayashi, Kazuya, to Toray Industries, Inc. Dyed synthetic fiber comprising silver-substituted zeolite and copper compound, and process for preparing same. 5,180,402, Cl. 8-490.000.

Kubota, Sadao: *See*—
Nakagaki, Nobufumi; Kurita, Toshiyuki; Murata, Toshinori; Kaizaki, Kazuhiro; Kubota, Sadao; Kamiya, Masanori; Sekiya, Hiroshi; and Fujiwara, Kenichi, 5,181,116, Cl. 358-159.000.

Kuenast, Christoph: *See*—
Leyendecker, Joachim; Neubauer, Hans-Juergen; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; and Krieg, Wolfgang, 5,180,727, Cl. 514-255.000.

Kuhn, David G.; Furch, Joseph A.; and Kamhi, Victor M., to American Cyanamid Company. Insecticidal and acaricidal diarylpyrrolecarbonitrile and diarylnitropyrrole compounds. 5,180,734, Cl. 514-426.000.

Kuhn, John W., to CMI International, Inc. Method of eliminating porosity defects within aluminum cylinder blocks having cast-in-place metallurgically bonded cylinder liners. 5,179,994, Cl. 164-100.000.

Kukimoto, Tsutomu; Yusa, Hiroshi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; and Kuwashima, Tetsuhito, to Canon Kabushiki Kaisha. Toner having crosslinkages and method of fixing same. 5,180,649, Cl. 430-106.600.

Kumata, Etsuko: *See*—
Ueno, Hiroshi; Hatabu, Shoji; Kumata, Etsuko; and Adachi, Takehiro, 5,180,231, Cl. 384-527.000.

Kumazawa, Keiji: *See*—
Oshibe, Yoshihiro; Izumi, Toshihiro; Doya, Hideki; Ohmura, Hiroshi; Yamamoto, Yasuhiro; and Kumazawa, Keiji, 5,180,760, Cl. 523-169.000.

Kume, Hidehiro; Yamamoto, Etsufumi; and Matsumoto, Yoshiyuki, to Sony Corporation. Optical pickup device for a recording and/or reproducing apparatus. 5,181,193, Cl. 369-44.230.

Kume, Hidehiro; and Yamamoto, Etsufumi, to Sony Corporation. Tracking error signal generator with DC offset cancellation. 5,181,195, Cl. 369-44.410.

Kumiai Chemical Industry Co., Ltd.: *See*—
Katou, Susumu; and Nakamura, Kanji, 5,180,416, Cl. 504-136.000.

Kump, Wilhelm; Borel, Christian; Chen, Jen; Veenstra, Siem J.; Francis, John; and Mugrage, Benjamin B., to Ciba-Geigy Corporation. Acyl derivatives of oxazolorifamycins. 5,180,718, Cl. 514-183.000.

Kung, Robert T. V.; and Stewart, Robert B., to Abiomed, Inc. Laser surgery system. 5,180,378, Cl. 606-10.000.

Kung, Viola T.: *See*—
Ghazarossian, Vartan; Kung, Viola T.; and Zuk, Robert F., 5,180,828, Cl. 546-37.000.

Kunimoto, Toshifumi, to Yamaha Corporation. Musical tone synthesizing apparatus using wave guide synthesis. 5,180,877, Cl. 84-624.000.

Kunitomo, Yuichi: *See*—
Arima, Yukio; Yanagimoto, Hiroaki; Kunitomo, Yuichi; and Tominaga, Tetsuyoshi, 5,179,954, Cl. 128-660.070.

Kuo, Yeong-Jen; and Bellas, Michael, to Eastman Kodak Company. Purification of quinones. 5,180,842, Cl. 552-293.000.

Kuraray Co., Ltd.: *See*—
Maeda, Hiroshi; Suzuki, Fujio; and Oda, Tatsuya, 5,180,582, Cl. 424-94.400.

Kuratle, Rolf: *See*—
Sonderegger, Hans; Kuratle, Rolf; and Wolfer, Peter, 5,179,857, Cl. 73-117.300.

Kurematsu, Masayuki: *See*—
Kobayashi, Hiroaki; Koboshi, Shigeharu; Kurematsu, Masayuki; and Ishikawa, Masao, 5,180,656, Cl. 430-393.000.

Kurihara, Toshio: *See*—
Hibino, Hiromi; Hasegawa, Kazumi; Nishida, Koujiro; Abe, Kouzou; and Kurihara, Toshio, 5,180,238, Cl. 400-247.000.

Kurisu, Hironori: *See*—
Sugie, Noboru; Furukawa, Kenichi; Ogawa, Makoto; Kurisu, Hironori; Mitsui, Tomonori; Aito, Akio; Nakamura, Mitsunori; and Mochizuki, Hiroshi, 5,181,197, Cl. 369-75.100.

Kurita, Toshiyuki: *See*—
Nakagaki, Nobufumi; Kurita, Toshiyuki; Murata, Toshinori; Kaizaki, Kazuhiro; Kubota, Sadao; Kamiya, Masanori; Sekiya, Hiroshi; and Fujiwara, Kenichi, 5,181,116, Cl. 358-159.000.

Kuroda, Shigetaka; and Iwata, Yoichi, to Honda Giken Kogyo Kabushiki Kaisha. System for detecting deterioration of a three-way catalyst of an internal combustion engine. 5,179,833, Cl. 60-276.000.

Kuroda, Takashi: *See*—
Sakuragi, Satoshi; Ikeda, Takeshi; and Kuroda, Takashi, 5,181,240, Cl. 379-98.000.

Kurono, Masayasu: *See*—
Sawai, Kiichi; Kurono, Masayasu; Mitani, Takahiko; Nagabuchi, Masanori; and Anzai, Keizo, 5,180,739, Cl. 514-491.000.
Kurosu, Yasuo; Yokoyama, Yoshihiro; Nishikawa, Kenichi; Masuzaki, Hidefumi; and Fujinawa, Masaaki, to Hitachi, Ltd. Method for determining the amount of skew of image, method for correcting the same, and image data processing system. 5,181,260, Cl. 382-46.000.
Kursar, Gerald H., to Jermik Systems, Ltd. Portable diurnal intraocular pressure recording system. 5,179,953, Cl. 128-645.000.
Kusada, Tokutarou: *See*—
Matsumoto, Toshio; Yasuda, Shuhei; Kusada, Tokutarou; and Nagashima, Nobuyoshi, 5,181,121, Cl. 358-236.000.
Kutschker, Wolfgang; and Pesold, Erwin, to Reinhardt Maschinenbau GmbH. Plate shears. 5,179,884, Cl. 83-156.000.
Kuwabara, Heikichi: *See*—
Okada, Ryoji; Sato, Motohiro; Yamada, Toshihiro; and Kuwabara, Heikichi, 5,180,001, Cl. 165-80.400.
Kuwahara, Seiji: *See*—
Saita, Yoshiaki; Kuwahara, Seiji; and Sato, Yoshinori, 5,181,046, Cl. 346-76.0PH.
Kuwashima, Tetsuhito: *See*—
Kukimoto, Tsutomu; Yusa, Hiroshi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; and Kuwashima, Tetsuhito, 5,180,649, Cl. 430-106.600.
Kweon, Yong-geol, to Samsung Electron Devices Co., Ltd. Electron gun for cathode ray tube. 5,180,945, Cl. 315-14.000.
Kwun, Hegeon; Burkhardt, Gary L.; and Fisher, Jay L., to Southwest Research Institute. Detection of reinforcing steel corrosion in concrete structures using non-linear harmonic and intermodulation wave generation. 5,180,969, Cl. 324-71.200.
Kyoto Handotai Co., Ltd.: *See*—
Abe, Yasuhiko, 5,180,469, Cl. 156-653.000.
Kyowa Hakko Kogyo Co., Ltd.: *See*—
Arai, Hitoshi; Kono, Motomichi; Kasai, Masaji; Gomi, Katsushige; and Ashizawa, adashi, 5,180,825, Cl. 544-318.000.
Kyowa Hakko Kogyo, Ltd.: *See*—
Iwata, Satoshi; and Shiomi, Michio, 5,180,670, Cl. 435-119.000.
Kyushima, Hiroyuki, to Hamamatsu Photonics K.K. Photomultiplier tube with dynode array having venetian-blind structure. 5,180,943, Cl. 313-535.000.
La Jolla Cancer Research Foundation: *See*—
Ruoslahti, Erkki I., 5,180,808, Cl. 530-350.000.
Ruoslahti, Erkki I.; Engvall, Eva; and Gehlsen, Kurt R., 5,180,809, Cl. 530-350.000.
Laarman, Timothy: *See*—
DiDio, Gary M.; Jones, Kermit; Hoffman, Kevin; Laarman, Timothy; Call, Jon; and Nath, Prem, 5,180,434, Cl. 118-718.000.
Laboratoire L. Lafon: *See*—
Lafon, Louis, 5,180,745, Cl. 514-618.000.
Laboratoires Biotrol: *See*—
Holtermann, Henri, 5,180,377, Cl. 604-342.000.
Laboratorium fur experimentelle Chirurgie: *See*—
Klaue, Kaj, 5,180,395, Cl. 623-23.000.
LaCrosse, Gaylen: *See*—
Hinson, Charles; and LaCrosse, Gaylen, 5,180,499, Cl. 210-706.000.
Lafon, Louis, to Laboratoire L. Lafon. Method for providing a neuroprotective effect. 5,180,745, Cl. 514-618.000.
Lahrman, Frank H.: *See*—
Berg, Charles J.; Roe, Donald C.; and Lahrman, Frank H., 5,180,622, Cl. 428-192.000.
Lai, Christopher C.: *See*—
Quick, James R.; Alexander, James L.; Lai, Christopher C.; Mathews, Susan A.; and Wenzel, Donna J., 5,180,894, Cl. 219-10.55E.
Lai, Wen-Chao; Rourke, William J.; and Natansohn, Samuel, to GTE Products Corporation. Treatment of industrial wastes. 5,180,563, Cl. 423-21.500.
Lain, Cheng K. Torsional spring insole and method. 5,179,791, Cl. 36-27.000.
Laird, Douglas; and D'Souza, Godfrey P., to LSI Logic Corporation. Delay compensator and monitor circuit having timing generator and sequencer. 5,180,937, Cl. 307-602.000.
Lamontagne, Mario: *See*—
Moreau, Christian; Lamontagne, Mario; and Cielo, Paolo, 5,180,921, Cl. 250-554.000.
Lampe, Steven, to Sundstrand Corporation. Stored energy system for driving a turbine wheel. 5,179,831, Cl. 60-39.142.
Lampotang, Samsun: *See*—
Gibby, Gordon L.; Lampotang, Samsun; Hathiram, Daraius; and Gravenstein, Nikolaus, 5,180,896, Cl. 219-10.55A.
Lanctot, Paul A.; and Collett, Donald E. Baseball bat. 5,180,163, Cl. 273-72.00R.
Landi, Curtis L.; and Wilson, Susan L., to Supracor Systems, Inc. Perforated honeycomb. 5,180,619, Cl. 428-116.000.
Landolt, Carlos A.: *See*—
Marcuson, Samuel W.; Landolt, Carlos A.; Amson, James H.; and Davies, Haydn, 5,180,423, Cl. 75-649.000.
Langlais, Thierry; Bastien, Jean-Paul; and Boisson, Jean-Yves, to Telecommunications Radioelectriques El Telephoniques. Data transmission arrangement using a statistic coding, a transmitter and a receiver section suitable for such an arrangement. 5,181,229, Cl. 375-114.000.
Lanman, Bennie L. Waterbed sheet attachment system. 5,179,743, Cl. 5-498.000.
Lanxide Technology Company, LP: *See*—
Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; White, Danny R.; Johnson, William B.; and Aghajanian, Michael K., 5,180,697, Cl. 501-96.000.
Laramie, Matthew J.: *See*—
McLane-Goetz, Lee A. M.; Laramie, Matthew J.; McClelland, Kevin L.; McCormick, Robert L.; and Schultz, Allen L., 5,180,279, Cl. 415-177.000.
Lasell, Steven M.: *See*—
Khasanov, Robert M., 5,180,429, Cl. 106-685.000.
Laska, Douglas J.: *See*—
Schwartzbauer, Neil J.; and Laska, Douglas J., 5,180,109, Cl. 239-346.000.
Latham, Larry: *See*—
Mosher, Dan M.; Latham, Larry; Todd, Bob; Blanton, Cornelia H.; Trogolo, Joe R.; and Cotton, David R., 5,181,095, Cl. 257-370.000.
Lau, Sai K., to Westinghouse Electric Corp. Corrosion resistant magnesium titanate coatings for gas turbines. 5,180,285, Cl. 416-241.00B.
Laue, Hans-Jorg, to Finnigan Mat GmbH. Method and mass spectrometer for mass spectroscopic or mass spectrometric investigation of particles. 5,180,913, Cl. 250-281.000.
Laurent, Daniel, to Compagnie Generale des Etablissements Michelin—Michelin & Cie. Self-locking sector-type mold for the vulcanization of tires. 5,180,592, Cl. 425-46.000.
Lausberg, Dietrich: *See*—
Taubitz, Christof; Seiler, Erhard; Boehlke, Klaus; and Lausberg, Dietrich, 5,180,778, Cl. 525-74.000.
Lautenschlager, Horst, to Karl Lautenschlager GmbH & Co. KG. Metal drawer sides. 5,180,217, Cl. 312-334.700.
LaVallee, James R.; Hilsenbeck, Jerry M.; Brown, James G.; Sumner, Roger A.; Zazzera, Andre C.; and Bailey, Dana A., to Rockwell International Corporation. Automatic call returning method for call distributor with message record capability. 5,181,236, Cl. 379-67.000.
Lavengood, Richard E.: *See*—
Padwa, Allen R.; Lavengood, Richard E.; and Patel, Raman, 5,180,777, Cl. 525-66.000.
Lawandi, Victor. Quick-disconnect knockdown furniture having a flexible support with a plurality of frame member storage pockets. 5,180,208, Cl. 297-440.000.
Lawless, Michael W.: *See*—
Natwick, Vernon R.; Lawless, Michael W.; Doll, Joseph E.; and Wu, Chung-You C., 5,180,287, Cl. 417-43.000.
Lawrence, Paul B.: *See*—
Bagrodia, Shriram; Fagerburg, David R.; Gedon, Steven; Watkins, Joseph J.; Lawrence, Paul B.; and Rule, Mark, 5,180,775, Cl. 525-64.000.
LCOA Laminating Company of America: *See*—
Block, James P.; Levasheff, Stanley W.; and Jarosek, Gordon G., 5,179,770, Cl. 29-17.300.
Le Carbone Lorraine: *See*—
Bauer, Jean-Michel; and Bontems, Maurice, 5,180,459, Cl. 156-89.000.
Leach & Garner Co.: *See*—
Agarwal, Dwarika P., 5,180,551, Cl. 420-511.000.
LeBlanc, Joseph R.: *See*—
Lee, Jing M.; and LeBlanc, Joseph R., 5,180,570, Cl. 423-359.000.
Lechleider, Joseph W., to Bell Communications Research, Inc. Coordinated transmission for two-pair digital subscriber lines. 5,181,198, Cl. 370-32.100.
Lee, Chenault D. Disposable vaginal speculum. 5,179,937, Cl. 128-17.000.
Lee, Ching C., to Sun Son Aluminum Factory Co., Ltd. Upper fixing member for a golf cart. 5,180,087, Cl. 224-274.000.
Lee, Hideki: *See*—
Ibuka, Shigehito; and Lee, Hideki, 5,180,692, Cl. 437-240.000.
Lee, J. Kelly; Reznik, Svetlana; and Regelsberger, Matthias H., to Eastman Kodak Co. Responder target for theft detection apparatus. 5,181,021, Cl. 340-572.000.
Lee, Jin H.: *See*—
Kang, Cheol S.; and Lee, Jin H., 5,181,109, Cl. 358-105.000.
Lee, Jin-Yuan: *See*—
Liu, Hsien-Tsung; Lee, Jin-Yuan; Wang, Jiann-Kwang; Yoo, Chue-San; and Wang, Pei-Jan, 5,180,689, Cl. 437-228.000.
Lee, Jing M.; and LeBlanc, Joseph R. Integrated process for making methanol and ammonia. 5,180,570, Cl. 423-359.000.
Lee, Joon H.: *See*—
Choi, Hae Y.; and Lee, Joon H., 5,181,117, Cl. 358-169.000.
Lee, Robert D.: *See*—
Harrington, Thomas E., III; and Lee, Robert D., 5,181,091, Cl. 257-355.000.
Lee, Yee-Chun, to United States of America, Energy. Micro-valve pump light valve display. 5,181,016, Cl. 340-788.000.
Lees, Robert G.: *See*—
Jacobs, William, III; Luciw, Fred W.; Kancans, Ilze B.; Thomas, Daniel W.; Boldizer, Leslie; and Lees, Robert G., 5,180,835, Cl. 548-303.400.
Lefevre, Herve ; and Martin, Philippe, to Photonetics S.A. Fiber optic measuring device, rate gyro, navigation and stabilization system, and current sensor. 5,181,078, Cl. 356-350.000.
Legrand, Franz: *See*—
Lerot, Luc; Legrand, Franz; and Bourjot, Joel, 5,180,693, Cl. 501-12.000.
Lehtinen, Kauko; Oikari, Timo; and Yrjonen, Tapio, to Wallac Oy. Apparatus for detecting ionizing radiation. 5,180,916, Cl. 250-367.000.

Leibowitz, Alec; and Cooke, Peter, to Brilcut Patentanstalt. Working gemstones. 5,179,931, Cl. 125-30.010.

Leibrock, Joachim: *See*—
Barde, Yves-Alain; Leibrock, Joachim; Lottspeich, Friedrich; Yancopoulos, George; and Thoenen, Hans, 5,180,820, Cl. 536-23.510.

Leinen, Chris M.; and Schendel, Robert E., to Topworks, Inc. Captive cylinder linear solenoid valve positioner. 5,179,887, Cl. 91-387.000.

Leinen, Chris M.: *See*—
Schendel, Robert E.; and Leinen, Chris M., 5,179,888, Cl. 91-387.000.

Leitch, Leonard C.: *See*—
Morand, Peter; Arnason, John T.; Philogene, Bernard J. R.; MacEachern, Anita M.; Leitch, Leonard C.; and Kaminski, Jerzy, 5,180,838, Cl. 549-59.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Gorelick, Steven M.; and Gvirtzman, Haim, 5,180,503, Cl. 210-758.000.

Lemna Corporation, The: *See*—
Ngo, Viet H.; Poole, Warren D.; Hancock, Sean J.; and France, Timothy T., 5,180,501, Cl. 210-747.000.

Le Moigne, Jacques; Thierry, Annette; and Guerder, Pierre, to Quartz et Silice. Method for forming coated monocrystalline products. 5,180,463, Cl. 156-603.000.

Lenhart, Kenneth J.; Barron, Michael L.; Wakeman, Thomas G.; and Bellia, Donald L., to General Electric Company. Gas turbine engine structural frame with multi-yoke attachment of struts to outer casing. 5,180,282, Cl. 415-209.200.

Lense, Robert F., to Amerock Corporation. Operating mechanism for a roof window. 5,179,803, Cl. 49-386.000.

Lepori, Agostino; Zavatteri, Ignazio; and Cova, Mario, to Presidenza Del Consiglio Dei Ministri. Binding compositions for lignocellulosic composites and method for the preparation thereof. 5,180,770, Cl. 524-563.000.

Lerner, Richard A.: *See*—
Dillner, Joakim; Lerner, Richard A.; Smith, Richard; and Parks, D. Elliot, 5,180,806, Cl. 530-326.000.

Lerot, Luc; Legrand, Franz; and Bourjot, Joel, to Solvay S.A. Process for the production of a composite of metal oxides, composite powders of metal oxides and ceramic materials. 5,180,693, Cl. 501-12.000.

Leslie, Kenrick R.: *See*—
Sam, Richard C.; Leslie, Kenrick R.; and Goodwin, James E., 5,181,215, Cl. 372-34.000.

Lesne, Michel: *See*—
Husa, Robert K.; Hallinan, E. Ann; Lesne, Michel; and Herin, Marc, 5,180,720, Cl. 514-211.000.

Letechipia, Jorge, to Good Shepherd Rehabilitation Hospital, The. Motorized movable storage bag for use on a wheelchair. 5,180,181, Cl. 280-304.100.

Lethin, Richard A.: *See*—
Pearson, Scott A.; Oh, Jin; Lethin, Richard A.; and Howlett, Eric F., 5,180,132, Cl. 248-362.000.

Letrange, Frederic: *See*—
Marsais, Christian; and Letrange, Frederic, 5,180,005, Cl. 165-178.000.
Marsais, Christian; and Letrange, Frederic, 5,180,006, Cl. 165-178.000.

Leuze Electronic GmbH & Co.: *See*—
Spratte, Hans H.; and Pepperl, Rudiger, 5,180,910, Cl. 250-221.000.

Levasheff, Stanley W.: *See*—
Block, James P.; Levasheff, Stanley W.; and Jarosek, Gordon G., 5,179,770, Cl. 29-17.300.

Level One Communications, Inc.: *See*—
Takatori, Hiroshi, 5,181,228, Cl. 375-103.000.

Levene, Harold B.; Barnhart, James L.; and Widder, Kenneth J., to Molecular Biosystems, Inc. Method of abdominal ultrasound imaging. 5,179,955, Cl. 128-662.020.

LeVine, Joseph W., to Westvaco Corporation. Modified rosin esters and their use in printing inks. 5,180,774, Cl. 525-54.440.

Lewis, Brian, to GSW Inc. Water heater bottom insulation member. 5,180,077, Cl. 220-444.000.

Lewis, Larry N.: *See*—
Renlund, Gary M.; Lewis, Larry N.; Stein, Judith; and Bracco, Angelo A., 5,180,694, Cl. 501-12.000.

Leybold Aktiengesellschaft: *See*—
Drechsel, Dieter; and Jericho, Karl, 5,180,562, Cl. 422-429.000.

Leyendecker, Joachim; Neubauer, Hans-Juergen; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; and Krieg, Wolfgang, to BASF Aktiengesellschaft. Phenoxyalkyl-substituted heteroaromatics and their use for controlling pests. 5,180,727, Cl. 514-255.000.

Lieb, Matthew J., to Outboard Marine Corporation. Remote switching system for an electric trolling motor. 5,180,925, Cl. 307-114.000.

Liebregts, Paulus M. M., to Stork Brabant B.V. Pattern repeat presetting of a multi-color rotary screen printing machine. 5,179,897, Cl. 101-129.000.

Liere, Horst: *See*—
Brennecke, Hermann; and Liere, Horst, 5,181,266, Cl. 385-78.000.

Liersch, Manfred: *See*—
Grutter, Markus G.; Heinz, Dirk; and Liersch, Manfred, 5,180,667, Cl. 435-69.200.

Lim, Jong-Sang: *See*—
Shim, Dae-Yoon; and Lim, Jong-Sang, 5,181,184, Cl. 364-758.000.

Limb, Stanley R. Combination vacuum assist centrifugal casting apparatus and method. 5,179,995, Cl. 164-114.000.

Limouzin, Dominique: *See*—
De Seroux, Nicolas; and Limouzin, Dominique, 5,180,541, Cl. 376-271.000.

Lin, Chao-Pin. Stunt kite with control mechanism. 5,180,123, Cl. 244-155.00A.

Lin, Chin-Yung. Cloth winding device for circular knitting machine. 5,179,846, Cl. 66-149.00R.

Lin, Fan-Nan: *See*—
Pennella, Filippo; Lin, Fan-Nan; and Johnson, Marvin M., 5,180,485, Cl. 208-254.00R.

Lind, Harold V.; Fried, Walter R.; and Bricker, Jacob L., to Hughes Aircraft Company. Accurate location system using transponded and correlated LORAN signals. 5,181,041, Cl. 342-453.000.

Lindauer, Jerome I., to International Flavors & Fragrances Inc. Dispensing unit of volatilizable substance capable of visible determination of its extent of use. 5,180,107, Cl. 239-35.000.

Linder, William J.: *See*—
Meyerson, Scott C.; Linder, William J.; and Maile, Keith R., 5,179,947, Cl. 128-419.0PG.

Lindner, Christian: *See*—
Lutjens, Holger; Westeppe, Uwe; Piejko, Karl-Erwin; and Lindner, Christian, 5,180,781, Cl. 525-148.000.

Line, Richard J., to United States of America, Army. Infinitely variable transmission. 5,179,865, Cl. 476-51.000.

Lipic, Joseph G., to Alexander Manufacturing Company. Key ring and screwdriver device. 5,179,748, Cl. 7-165.000.

Liposome Technology, Inc.: *See*—
Abra, Robert; and Szoka, Francis C., 5,180,713, Cl. 514-31.000.

Lipton, Lenny, to StereoGraphics Corporation. Drive method for twisted nematic liquid crystal shutters for stereoscopic and other applications. 5,181,133, Cl. 359-84.000.

Lir France: *See*—
Favre, Bernard, 5,180,084, Cl. 222-192.000.

Listemann, Mark L.; and Pinschmidt, Robert K., Jr., to Air Products and Chemicals Inc. Preparation of N-(l-alkoxyalkyl)formamide and alkylidene bisformamides using amine neutralized ion exchange resins. 5,180,851, Cl. 564-134.000.

Lister, David M. Chiseling apparatus. 5,180,210, Cl. 299-70.000.

Littleford, Philip O., deceased; and by Bates, H. Richard, personal representative. Catheter guiding and positioning method. 5,179,961, Cl. 128-772.000.

Liu, Hsien-Tsung; Lee, Jin-Yuan; Wang, Jiann-Kwang; Yoo, Chue-San; and Wang, Pei-Jan, to Taiwan Semiconductor Manufacturing Company. Tapered opening sidewall with multi-step etching process. 5,180,689, Cl. 437-228.000.

Livermore, Richard S.: *See*—
Frey, Max; Livermore, Richard S.; and Bowie, John M., 5,179,881, Cl. 83-98.000.

Lockridge, James E.: *See*—
Alden, Lorne B.; Cole, James T.; Lockridge, James E.; and Costello, Thomas E., 5,180,898, Cl. 219-388.000.

Lohmann, Detlef: *See*—
Hellyer, Richard A.; Wagner, James R.; Pees, James M.; and Lohmann, Detlef, 5,180,144, Cl. 267-64.190.

Lohr, Billy J.: *See*—
Edwards, John J.; and Lohr, Billy J., 5,179,797, Cl. 43-17.500.

Loiseaux, Brigitte: *See*—
Nicolas, Christophe; Loiseaux, Brigitte; Huignard, Jean-Pierre; and Puech, Claude, 5,181,054, Cl. 353-20.000.

Loison, Dominique: *See*—
Blin, Philippe; Sosin, Laurent; and Loison, Dominique, 5,179,996, Cl. 164-428.000.

Long Manufacturing Ltd.: *See*—
Meekins, Kris J.; and Benson, Jeffrey P., 5,179,999, Cl. 165-41.000.

Lonky, Neal M., to Trylon Corporation, The. Apparatus for endoscopic examination of body cavity using chemiluminescent light source. 5,179,938, Cl. 128-18.000.

Lonza Ltd.: *See*—
Griffiths, Gareth; Warm, Aleksander; Previdoli, Felix; and Ryan, Gary, 5,180,826, Cl. 544-332.000.

Looker, Robert, to Satco, Inc. Air cargo container. 5,180,078, Cl. 220-665.000.

Lopes, Wiliam F., to General Electric Co. Adaptive lubrication oil system. 5,180,034, Cl. 184-6.100.

Loral Europe Limited: *See*—
Denchfield, Clifford, 5,180,878, Cl. 89-7.000.

L'Oreal: *See*—
Baudry, Alain; Junino, Alex; and Richard, Herve , 5,180,400, Cl. 8-405.000.
De Laforcade, Vincent, 5,180,242, Cl. 401-132.000.
Grollier, Jean F.; Cotteret, Jean; and Garoche, Didier, 5,180,396, Cl. 8-405.000.
Grollier, Jean F.; Cotteret, Jean; and Garoche, Didier, 5,180,397, Cl. 8-405.000.
Grollier, Jean F.; Cotteret, Jean; and Garoche, Didier, 5,180,399, Cl. 8-405.000.
Gueret, Jean-Louis H., 5,180,240, Cl. 401-88.000.
Gueret, Jean-Louis H., 5,180,241, Cl. 401-122.000.
Sebag, Claude; and Dubief, Claude, 5,180,584, Cl. 424-401.000.

Loreth, Andrzej; and Torok, Vilmos, to Astra-Vent AB. Corona discharge arrangements for the removal of harmful substances generated by the corona discharge. 5,180,404, Cl. 55-117.000.

Losee, D. Bruce; Morgan, Constance H.; Sprinkel, F. Murphy; and Utsch, Francis V., to Philip Morris Incorporated. Flavor generating article. 5,179,966, Cl. 131-351.000.

Lottspeich, Friedrich: *See—*
Barde, Yves-Alain; Leibrock, Joachim; Lottspeich, Friedrich; Yancopoulos, George; and Thoenen, Hans, 5,180,820, Cl. 536-23.510.

Louis A. Grant, Inc.: *See—*
Grant, Louis A., Jr., 5,179,757, Cl. 15-246.500.

Lovejoy, Michael W.; and Trice, Jennifer L., to Minnesota Mining and Manufacturing Company. High-intensity rotary peening particle support and method of making same. 5,179,852, Cl. 72-53.000.

Lovell, Walter C., to Tapeswitch Corporation of America. Electrical resistance element with heat-sensitive disconnect capability. 5,180,900, Cl. 219-517.000.

Lowell, Kenneth W.: *See—*
Helit, Thomas M.; Lowell, Kenneth W.; and Synnett, Karen P., 5,180,157, Cl. 271-256.000.

Lowrance, Arlen J. Microswitch activating device for fishing game apparatus. 5,180,170, Cl. 273-343.000.

LSI Logic Corporation: *See—*
Hansen, Keith J., 5,180,432, Cl. 118-697.000.
Laird, Douglas; and D'Souza, Godfrey P., 5,180,937, Cl. 307-602.000.
Tong, Po; and Ruetz, Peter, 5,181,031, Cl. 341-65.000.

LSR Environmental Systems Company: *See—*
Smolensky, Leo A.; and Wysk, S. Ronald, 5,180,486, Cl. 210-195.100.

Lucas Industries: *See—*
Green, Alan C., 5,180,290, Cl. 417-218.000.

Lucas Industries Public Limited Company: *See—*
Farr, Glyn P. R., 5,180,212, Cl. 303-9.680.

Lucey, Michael. Photopolymerizable compositions used in electronics. 5,180,757, Cl. 522-76.000.

Luciw, Fred W.: *See—*
Jacobs, William, III; Luciw, Fred W.; Kancans, Ilze B.; Thomas, Daniel W.; Boldizer, Leslie; and Lees, Robert G., 5,180,835, Cl. 548-303.400.

Lucky, Ltd.: *See—*
Ha, Jae M.; Jeong, Kwang L.; and Suh, Sung S., 5,180,575, Cl. 404-49.000.

Ludwig Institute for Cancer Research: *See—*
Druez, Catherine; Coulie, Pierre; Uyttenhove, Catherine; and Van Snick, Jacques, 5,180,678, Cl. 436-501.000.

Luk Lamellen Und Kupplungsbau GmbH: *See—*
Maucher, Paul; and Friedmann, Oswald, 5,180,335, Cl. 464-68.000.

Lund, Gary K.; Spinti, Mark J.; and Doll, Daniel W., to Thiokol Corporation. Solid propellant formualtions producing acid neutralizing exhaust. 5,180,452, Cl. 149-19.900.

Lutjens, Holger; Westeppe, Uwe; Piejko, Karl-Erwin; and Lindner, Christian, to Bayer Aktiengesellschaft. Process for the production of alloys of rubbers and aromatic polyesters. 5,180,781, Cl. 525-148.000.

Lutron Electronics Co., Inc.: *See—*
Dierenbach, Karl; Jacoby, Elliot G., Jr.; Snavely, Dan A.; Tucker, Darryl W.; Walck, Scott N.; and Walck, Scott N., 5,180,886, Cl. 174-66.000.

Lux, Jurgen A.: *See—*
Young, James E.; McManigill, Douglass; and Lux, Jurgen A., 5,180,475, Cl. 204-180.100.

Lyman, Tommy L.; and Newman, Kenneth B., to General Motors Corporation. Liquid accumulator. 5,179,844, Cl. 62-503.000.

Lynnerup, Ole: *See—*
Siemssen, Siema O.; and Lynnerup, Ole, 5,179,941, Cl. 128-40.000.

Lynnworth, Lawrence C., to Panametrics, Inc. Snap-on flow measurement system. 5,179,862, Cl. 73-861.280.

Ma, Thomas T., to Ford Motor Company. Emission control. 5,180,559, Cl. 422-168.000.

Macartney, Robert M.: *See—*
Cicatello, Samuel; and Macartney, Robert M., 5,179,892, Cl. 100-32.000.

MacDonald, William M.: *See—*
Ackerman, David A.; Blonder, Greg E.; and MacDonald, William M., 5,181,216, Cl. 372-36.000.

MacEachern, Anita M.: *See—*
Morand, Peter; Arnason, John T.; Philogene, Bernard J. R.; MacEachern, Anita M.; Leitch, Leonard C.; and Kaminski, Jerzy, 5,180,838, Cl. 549-59.000.

Macha, Deborah Carla: *See—*
Maki, Donald F., 5,180,177, Cl. 280-47.150.

Mack, Richard B.: *See—*
Belanger, Roger R.; Mack, Richard B.; and Novick, Michael A., 5,180,160, Cl. 271-315.000.

Mackay, Donald; Paul, Joseph; and Goble, Greg, to Dataproducts Corporation. Phase change ink replenishment system. 5,181,049, Cl. 316-140.00R.

MacLeod, Alan D.: *See—*
McEwen, Robert K.; and MacLeod, Alan D., 5,180,912, Cl. 250-234.000.

Macomber, David W.: *See—*
Smith, Terrance P.; Macomber, David W.; Chang, Jeffrey C.; and Williams, Linda K., 5,180,705, Cl. 503-227.000.

Maeda, Hiroshi; Suzuki, Fujio; and Oda, Tatsuya, to Maeda, Hiroshi; and Kuraray Co., Ltd. Superoxide dismutase derivatives, a method of producing the same and medicinal uses of the same. 5,180,582, Cl. 424-94.400.

Magee, Ronald, to Milliken Research Corporation. Seamless modular tile. 5,179,749, Cl. 8-150.000.

Magome, Nobutaka: *See—*
Sakakibara, Yasuyuki; Makinouchi, Susumu; Magome, Nobutaka; and Shiraishi, Naomasa, 5,181,067, Cl. 355-43.000.

Magruder, Judy A.; Peery, John R.; and Eckenhoff, James B., to Alza Corporation. Delivery device with a protective sleeve. 5,180,591, Cl. 424-473.000.

Maile, Keith R.: *See—*
Meyerson, Scott C.; Linder, William J.; and Maile, Keith R., 5,179,947, Cl. 128-419.0PG.

Mair, Manfred: *See—*
Weiss, Werner; Mair, Manfred; Deisenhofer, Manfred; and Poesl, Ewald, 5,180,695, Cl. 501-66.000.

Mairose, Hans-Peter: *See—*
Bogotzek, Hans; Mairose, Hans-Peter; and Orth, Erich, 5,179,775, Cl. 29-564.400.

Maisano, Joseph J., Jr.: *See—*
Abys, Joseph A.; Kadija, Igor V.; Maisano, Joseph J., Jr.; and Nakahara, Shohei, 5,180,482, Cl. 205-224.000.

Maki, Donald F., to Macha, Deborah Carla; and Maki, Donald F. Adjustable wheel support device. 5,180,177, Cl. 280-47.150.

Maki, Yoshitaka: *See—*
Terao, Shinji; and Maki, Yoshitaka, 5,180,742, Cl. 514-558.000.

Makinouchi, Susumu: *See—*
Sakakibara, Yasuyuki; Makinouchi, Susumu; Magome, Nobutaka; and Shiraishi, Naomasa, 5,181,067, Cl. 355-43.000.

Makita Corporation: *See—*
Ota, Hideo, 5,180,091, Cl. 227-8.000.

Malan, John M.: *See—*
Cowie, Theo D.; Malan, John M.; and Thomas, Malcolm W., 5,181,018, Cl. 340-825.310.

Malick, Shahzad H., to Pitney Bowes Inc. Method and apparatus for changing the direction of motion of flat articles. 5,180,154, Cl. 271-2.000.

Malick, Shahzad H., to Pitney Bowes Inc. Adjustable right angle transfer device for conveying flat articles in one of two directions. 5,180,159, Cl. 271-302.000.

Mallak, Joseph F., to Mallak, Joseph F. Unit load carrier and method for manipulating a unit load. 5,180,134, Cl. 248-544.000.

Man Roland Druckmaschinen AG: *See—*
Burger, Ranier; and Riescher, Georg, 5,179,899, Cl. 101-181.000.
Steiner, Gerd; Weniger, Rudi; Braun, Rolf; Otterbach, Rainer; Schubert, Erhard; and Hofmann, Ralf, 5,181,257, Cl. 382-17.000.

Manaka, Toshio, to Hitachi, Ltd. Method and apparatus for controlling air-fuel ratio in internal combustion engine. 5,179,924, Cl. 123-682.000.

Manikumar, Govindarajan: *See—*
Wall, Monroe E.; Wani, Mansukh C.; Nicholas, Allan W.; and Manikumar, Govindarajan, 5,180,722, Cl. 514-219.000.

Manke, Kevin R.; Ringgenberg, Paul D.; and Schultz, Roger L., to Halliburton Company. Low pressure responsive downhold tool with hydraulic lockout. 5,180,007, Cl. 166-321.000.

Manke, Kevin R.: *See—*
Ringgenberg, Paul D.; and Manke, Kevin R., 5,180,015, Cl. 166-386.000.

Mann, Thomas A. Water conserving toilet assembly. 5,179,739, Cl. 4-378.000.

Mannato, Pietro, to Finduck S.r.L. Bag, hand-bag, and any like travelling bag, with folding bag-closing upper member. 5,179,987, Cl. 150-118.000.

Mannesmann Aktiengesellschaft: *See—*
Moller, Rudolf; Brausfeld, Walter; Gottling, Helmut; Scharnowski, Gerhard; and Muller, Peter, 5,180,318, Cl. 439-716.000.

Mannesmann Rexroth GmbH: *See—*
Dantlgraber, Jorg, 5,179,836, Cl. 60-430.000.
Mehling, Horst, 5,180,296, Cl. 418-61.300.
Wusthof, Peter; and Cunningham, Sinclair, 5,179,889, Cl. 91-491.000.

Manz, Andreas, to Ciba-Geigy Corporation. Apparatus for the preparation of samples, especially for analytical purposes. 5,180,480, Cl. 204-299.00R.

Mao, Chung-Ling; Goldstein, Joel E.; and Iacoviello, John G., to Air Products and Chemicals, Inc. Nonwoven binders of vinyl acetate/ethylene/self-crosslinking monomer and tetramethylol glycoluril having improved shelf life. 5,180,772, Cl. 524-816.000.

Marathon Oil Company: *See—*
Plummer, Mark A., 5,180,572, Cl. 423-576.700.

March, Carl J.: *See—*
Dower, Steven K.; March, Carl J.; Sims, John E.; and Urdal, David L., 5,180,812, Cl. 530-351.000.

Marcus, Richard E. Simulated tightrope walking apparatus. 5,180,349, Cl. 482-34.000.

Marcuson, Samuel W.; Landolt, Carlos A.; Amson, James H.; and Davies, Haydn, to INCO Limited. Converter and method for top blowing nonferrous metal. 5,180,423, Cl. 75-649.000.

Marhold, Albrecht: *See—*
Schwarz, Hans-Helmut; Braden, Rudolf; Marhold, Albrecht; and Negele, Michael, 5,180,861, Cl. 570-160.000.

Markunas, Robert J.; Hendry, Robert; and Rudder, Ronald A., to Research Triangle Institute, Inc. Remote plasma enhanced CVD method and apparatus for growing an epitaxial semiconductor layer. 5,180,435, Cl. 118-723.000.

Marmon Corporation of Canada, Ltd., The: *See—*
Cannon, Robert W., 5,179,913, Cl. 119-43.000.

Marocco, Norbert. Torque limiting drive for blinds. 5,179,990, Cl. 160-176.100.

Marom, Abi: *See*—
Kranefeld, Andreas; Temburg, Josef; and Marom, Abi, 5,179,878, Cl. 83-13.000.

Marozsan, Andrew; and Peana, Daniel, to Motorola, Inc. Method and apparatus for correcting misalignments in couplings. 5,180,248, Cl. 403-13.000.

Marquis, Edward T.: *See*—
Sanderson, John R.; and Marquis, Edward T., 5,180,869, Cl. 585-255.000.

Marra, Dorothea C.: *See*—
Osipow, Lloyd I.; Marra, Dorothea C.; and Spitzer, J. George, 5,180,753, Cl. 521-65.000.

Marsais, Christian; and Letrange, Frederic, to Valeo Thermique Moteur. Device for mounting two pipe connections on two adjacent apertures of a heat exchanger casing. 5,180,005, Cl. 165-178.000.

Marsais, Christian; and Letrange, Frederic, to Valeo Thermique Moteur. Device for mounting two pipe connections on two adjacent apertures of a heat exchanger casing. 5,180,006, Cl. 165-178.000.

Marshall, Larry R.: *See*—
Burnham, Ralph L.; Kasinski, Jeffrey J.; and Marshall, Larry R., 5,181,211, Cl. 372-21.000.

Marshall, Roger N.; Hauck, Lane T.; Shapiro, Leonid; Busch, Jeffrey W.; and Stevens, Eric S., to Proxima Corporation. Method and apparatus for calibrating an optical computer input system. 5,181,015, Cl. 340-706.000.

Marsilio, Ronald M.; and Ohaus, Karl G., to American Standard Inc. Encapsulated overflow system for sinks and the like. 5,179,740, Cl. 4-651.000.

Marti, Peter: *See*—
Siegfried, Erwin; and Marti, Peter, 5,180,253, Cl. 405-146.000.

Martin, Edward G., to DSC Communications Corporation. Press fit pinless latching shroud. 5,180,312, Cl. 439-78.000.

Martin, Kenneth W.; and Buchwald, Aaron W., to University of California, The Regents of the. Differential-logic ring oscillator with quadrature outputs. 5,180,994, Cl. 331-38.000.

Martin, Kevin B.; and Martin, Ralph G. Diamond encapsulated resistance temperature detector. 5,181,008, Cl. 338-28.000.

Martin, Philippe: *See*—
Lefevre, Herve ; and Martin, Philippe, 5,181,078, Cl. 356-350.000.

Martin, Ralph G.: *See*—
Martin, Kevin B.; and Martin, Ralph G., 5,181,008, Cl. 338-28.000.

Martinsen, Lane G.: *See*—
Martinsen, Lyle J.; Martinsen, Stewart L.; and Martinsen, Lane G., 5,179,813, Cl. 52-743.000.

Martinsen, Lyle J.; Martinsen, Stewart L.; and Martinsen, Lane G. Repairing squeaking floors. 5,179,813, Cl. 52-743.000.

Martinsen, Stewart L.: *See*—
Martinsen, Lyle J.; Martinsen, Stewart L.; and Martinsen, Lane G., 5,179,813, Cl. 52-743.000.

Maruhashi, Yoshitsugu: *See*—
Sugiyama, Ikuo; Ishibashi, Kazuhisa; Takakusaki, Nobuyuki; Maruhashi, Yoshitsugu; Nishimura, Yasushi; Koyama, Hiroshi; Iida, Setsuko; and Sato, Koji, 5,180,893, Cl. 219-10.430.

Marui, Shogo: *See*—
Kishimoto, Shoji; Marui, Shogo; and Fujita, Takeshi, 5,180,735, Cl. 514-443.000.

Marunaka Kakoki Co., Ltd.: *See*—
Numao, Suteyoshi; and Miyajima, Makoto, 5,179,805, Cl. 51-149.000.

Marunaka Tsusho Co., Ltd.: *See*—
Numao, Suteyoshi; and Miyajima, Makoto, 5,179,805, Cl. 51-149.000.

Maruo, Yutaka, to Seiko Epson Corporation. High voltage CMOS devices. 5,181,090, Cl. 257-344.000.

Marvin, Dennis F.; and Hernandez-Solis, Maria, to Motorola, Inc. Thermally isolated ovenized crystal oscillator. 5,180,942, Cl. 310-346.000.

Marzullo, Joseph H., to Pitney Bowes Inc. Buckle chute paper stop adjustment mechanism. 5,180,357, Cl. 493-420.000.

Masaki, Mitsuo: *See*—
Isowa, Yoshikazu; Sato, Yoshiaki; Nakashima, Yoshiharu; Masaki, Mitsuo; Miyake, Norihisa; Uehara, Masaki; and Hirate, Kenji, 5,180,712, Cl. 514-16.000.
Okabe, Susumu; Masaki, Mitsuo; Yamakawa, Tomio; Matsukura, Hitoshi; and Nomura, Yutaka, 5,180,836, Cl. 548-302.700.

Mase, Akira: *See*—
Yamazaki, Shunpei; and Mase, Akira, 5,181,131, Cl. 359-56.000.

Mase, Toshiyasu; Tsuzuki, Ryuji; Hara, Hiromu; Murase, Kiyoshi; and Tomioka, Kenichi, to Yamanouchi Pharmaceutical Co., Ltd. Heterocyclic compounds. 5,180,730, Cl. 514-348.000.

Mason, Eileen, to Du Pont de Nemours, E. I., and Company. Method for the addition of powders to photographic systems. 5,180,651, Cl. 430-138.000.

Mason, Steven M.: *See*—
Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; White, Danny R.; Johnson, William B.; and Aghajanian, Michael K., 5,180,697, Cl. 501-96.000.

Masonite Corporation: *See*—
Beuving, Lauren J.; and Prader, Peter E., 5,179,986, Cl. 144-362.000.

Massachusetts Institute of Technology: *See*—
Gao, Wei; and Vander Sande, John B., 5,180,707, Cl. 505-1.000.

Massey, Richard C. Pegboard hook mounting assembly. 5,180,128, Cl. 248-220.400.

Massie, Stephen P., to Ford Motor Company. Apparatus and method for mechanically applying a sealing strip. 5,179,774, Cl. 29-451.000.

Masu, Kazuya: *See*—
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Masu, Kazuya, 5,180,687, Cl. 437-187.000.

Masuda, Nobuhito, to Fuji Photo Film Co., Ltd. Modified protein for carrying hapten. 5,180,815, Cl. 530-404.000.

Masuda, Toshiki, to Minolta Camera Kabushiki Kaisha. Process cartridge and image forming apparatus using such cartridge. 5,181,070, Cl. 355-200.000.

Masui, Susumu; Sakata, Kei; and Togashi, Fusao, to Kawasaki Steel Corp. Galvanized high-strength steel sheet having low yield ratio and method of producing the same. 5,180,449, Cl. 148-533.000.

Masumori, Hiroaki: *See*—
Ozato, Yukinori; Tamura, Nobuhiko; Masumori, Hiroaki; Yamamoto, Michihiro; Kojima, Atsuyuki; Nishikaku, Fumio; and Kimura, Yoshihiko, 5,180,731, Cl. 514-364.000.

Masuzaki, Hidefumi: *See*—
Kurosu, Yasuo; Yokoyama, Yoshihiro; Nishikawa, Kenichi; Masuzaki, Hidefumi; and Fujinawa, Masaaki, 5,181,260, Cl. 382-46.000.

Mathias, Haim H. G.: *See*—
Rink, William J.; Schlenoff, Joseph B.; and Mathias, Haim H. G., 5,181,233, Cl. 378-79.000.

Matiere, Marcel. Fluid-conveying conduit. 5,180,254, Cl. 405-155.000.

Matono, Takaaki: *See*—
Katsumata, Kenji; Hirahata, Shigeru; Sugiyama, Masato; Matono, Takaaki; Ishikura, Kazuo; Suzuki, Sunao; and Kaizaki, Kazuhiro, 5,181,110, Cl. 358-140.000.

Matrick, Howard; Shepard, Michele E.; and You, Young S., to Du Pont de Nemours, E. I., and Company. Aqueous ink jet inks containing polyol/alkylene oxide condensates as cosolvents. 5,180,425, Cl. 106-22.00R.

Matsuda, Nobuyoshi: *See*—
Morita, Yukio; Zushi, Toshihiro; Matsuda, Nobuyoshi; Suga, Kaneharu; and Takai, Takuma, 5,180,754, Cl. 521-85.000.

Matsuda, Shohei; and Yahagi, Toshio, to Honda Giken Kogyo Kabushiki Kaisha. Traction control method for vehicle. 5,181,174, Cl. 364-426.020.

Matsuda, Yoshihisa; Teroaka, Reiko; Tanaka, Yukio; and Abe, Hisato, to Nisshin Flour Milling Co., Ltd. Stabilized fat-soluble vitamin compositions. 5,180,747, Cl. 514-681.000.

Matsueda, Akira, to Olympus Optical Co., Ltd. Erase mark detecting circuit for detecting an erase mark superimposed on data recorded on a sector of an optical recording medium. 5,181,196, Cl. 369-48.000.

Matsui, Kenzo; and Imazu, Katsuhiro, to Toy Seikan Kaisha Ltd. Process for production of draw-ironed can. 5,179,854, Cl. 72-349.000.

Matsui, Toshitaka; Torisawa, Nobuyuki; and Yazawa, Yoshiyuki, to Fuji Photo Film Co., Ltd. Method of feeding sheets using a controlled suction pad movement. 5,180,156, Cl. 271-103.000.

Matsukura, Hitoshi: *See*—
Okabe, Susumu; Masaki, Mitsuo; Yamakawa, Tomio; Matsukura, Hitoshi; and Nomura, Yutaka, 5,180,836, Cl. 548-302.700.

Matsumoto, Kazuhiro; Matsuo, Masayuki; and Noda, Naoyuki, to Matsushita Electric Works, Ltd. Top loaded antenna. 5,181,044, Cl. 343-752.000.

Matsumoto, Takashi: *See*—
Ozawa, Yoshio; Matsumoto, Takashi; and Saito, Kimitoshi, 5,181,066, Cl. 355-29.000.

Matsumoto, Toshio; Yasuda, Shuhei; Kusada, Tokutarou; and Nagashima, Nobuyoshi, to Sharp Kabushiki Kaisha. Liquid crystal display device and driving method therefore. 5,181,121, Cl. 358-236.000.

Matsumoto, Toshio: *See*—
Era, Susumu; Matsumoto, Toshio; Kobayashi, Yoshinori; Shitara, Masashi; Hattori, Isamu; and Nomura, Yoshihiro, 5,180,786, Cl. 525-281.000.

Matsumoto, Yoshiyuki: *See*—
Kume, Hidehiro; Yamamoto, Etsufumi; and Matsumoto, Yoshiyuki, 5,181,193, Cl. 369-44.230.

Matsunaga, Fujihisa; Fukuhara, Hiroshi; and Yasuhara, Mitsuki, to Mitsui Petrochemical Industries, Ltd. Process for producing phenols. 5,180,871, Cl. 585-400.000.

Matsuo, Masayuki: *See*—
Matsumoto, Kazuhiro; Matsuo, Masayuki; and Noda, Naoyuki, 5,181,044, Cl. 343-752.000.

Matsuo, Naoto; Okada, Shozo; and Inoue, Michihiro, to Matsushita Electric Industrial Co., Ltd. Semiconductor memory device and a method for producing the same. 5,181,089, Cl. 257-299.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Matsuo, Naoto; Okada, Shozo; and Inoue, Michihiro, 5,181,089, Cl. 257-299.000.
Nishimura, Akihiro, 5,181,153, Cl. 360-132.000.
Nishiwaki, Seiji; Uchida, Shinji; and Asada, Junichi, 5,181,265, Cl. 385-33.000.
Okuda, Akira; and Yoshida, Yoshikazu, 5,180,433, Cl. 118-718.000.
Ueda, Tetsuya; Suzuki, Naoki; and Yano, Kohsaku, 5,180,436, Cl. 118-723.000.

Matsushita Electric Works, Ltd.: *See*—
Matsumoto, Kazuhiro; Matsuo, Masayuki; and Noda, Naoyuki, 5,181,044, Cl. 343-752.000.

Matsushita, Katsuhiko: *See*—
Tagami, Shigeru; Akimoto, Kazuo; Ito, Kanji; and Matsushita, Katsuhiko, 5,181,063, Cl. 354-435.000.
Tagami, Shigeru; Akimoto, Kazuo; Matsushita, Katsuhiko; and Ito, Kanji, 5,181,064, Cl. 354-437.000.

Matsuura, Hitoshi; and Aramaki, Hitoshi, to Fanuc Ltd. Tracing control system. 5,180,957, Cl. 318-578.000.

Matsuyama, Iwao: *See*—
Chiba, Katsuyoshi; Katsumoto, Masayuki; Uesaka, Yasutaro; Fukke, Hajime; Ishihara, Heigo; Matsuyama, Iwao; Kodama, Naoki; Inoue, Hitoshi; and Terada, Yoshiharu, 5,180,608, Cl. 427-560.000.
Fukke, Hajime; Akagi, Motoo; Matsuyama, Iwao; Katsumoto, Masayuki; Inoue, Hitoshi; Kodama, Naoki; and Uesaka, Yasutaro, 5,180,616, Cl. 428-64.000.

Matte, James T.: *See*—
Stout, Gregg W.; and Matte, James T., 5,180,010, Cl. 166-212.000.

Matthews, Susan A.: *See*—
Quick, James R.; Alexander, James L.; Lai, Christopher C.; Matthews, Susan A.; and Wenzel, Donna J., 5,180,894, Cl. 219-10.55E.

Mattiussi, Albert S., to Nelson Steel. Apparatus for rinsing metal strip. 5,179,967, Cl. 134-60.000.

Matusek, Ronald C. Belt buckle. 5,179,766, Cl. 24-163.00K.

Mauchan, Donald E., to Polaroid Corporation. Camera adaptor kit. 5,181,059, Cl. 354-108.000.

Maucher, Paul; and Friedmann, Oswald, to Luk Lamellen Und Kupplungsbau GmbH. Torsion damping assembly for use with clutches in motor vehicles. 5,180,335, Cl. 464-68.000.

Mault, James R. Respiratory calorimeter with bidirectional flow monitor. 5,179,958, Cl. 128-718.000.

Maurer-Rothmann, Andrea: *See*—
Wahl, Friedrich; Maurer-Rothmann, Andrea; and Merkenich, Karl, 5,180,564, Cl. 423-309.000.

Maxwell, Grant D.: *See*—
Stroud, Brian T.; Maxwell, Grant D.; and Rohachuk, Ronald E., 5,179,789, Cl. 34-54.000.

May, Sheldon W.: *See*—
Powers, James C.; May, Sheldon W.; Hernandez, Maria A.; Thornton, Steve; and Glinski, Jan, 5,180,831, Cl. 546-291.000.

Mayes, Michael K., to National Semiconductor Corp. Method and apparatus for reducing the effects of feedback switch charge injection into a plurality of serially connected sample data comparators. 5,180,930, Cl. 307-353.000.

Mayet, Jean-Claude: *See*—
Dailliez, Olivier; and Mayet, Jean-Claude, 5,180,462, Cl. 156-397.000.

McArdle, Christopher J. Wine bottle holder and display rack. 5,180,066, Cl. 211-74.000.

McCain Foods Limited: *See*—
Frey, Max; Livermore, Richard S.; and Bowie, John M., 5,179,881, Cl. 83-98.000.

McCann, Gerald P., to McCann's Engineering & Mfg. Co. Pouring spout and carbonation retention apparatus. 5,180,081, Cl. 222-23.000.

McCann, Michael: *See*—
Feldmeier, Daniel R.; and McCann, Michael, 5,180,599, Cl. 426-106.000.

McCann's Engineering & Mfg. Co.: *See*—
McCann, Gerald P., 5,180,081, Cl. 222-23.000.

McCarthy, Darleen D., executor: *See*—
McCarthy, Donald J., deceased; and Pastor, Manuel, 5,180,230, Cl. 384-54.000.

McCarthy, Donald J., deceased (by McCarthy, Darleen D., executor); and Pastor, Manuel, to ETEC Systems, Inc. Rolling element cage constraint. 5,180,230, Cl. 384-54.000.

McCarty, Gordon: *See*—
Shafe, Jeff; Straley, O. James; McCarty, Gordon; Oswal, Ravinder K.; and Dharia, Amitkumar N., 5,181,006, Cl. 338-22.00R.

McClellan, Bingham A. Eyeglass retainer. 5,181,052, Cl. 351-156.000.

McClelland, Kevin L.: *See*—
McLane-Goetz, Lee A. M.; Laramie, Matthew J.; McClelland, Kevin L.; McCormick, Robert L.; and Schultz, Allen L., 5,180,279, Cl. 415-177.000.

McComis, William T.: *See*—
Hsieh, Paonan; McComis, William T.; Senapati, Nagabhusan; Stulen, Foster B.; and Paul, Darrell D., 5,180,600, Cl. 426-233.000.

McConnell, Stanley B., to Dowell Schlumberger Incorporated. Chemical removal of thiourea from hydrochloric acid. 5,180,500, Cl. 210-721.000.

McCormack, Michael D.; and Rock, Alan D., to Atlantic Richfield Company. Adaptive network for automated first break picking of seismic refraction events and method of operating the same. 5,181,171, Cl. 364-421.000.

McCormick, Robert L.: *See*—
McLane-Goetz, Lee A. M.; Laramie, Matthew J.; McClelland, Kevin L.; McCormick, Robert L.; and Schultz, Allen L., 5,180,279, Cl. 415-177.000.

McCormick, William K.: *See*—
Dowden, Douglas C.; Hemmeter, Richard W.; Herr, Diane E.; McCormick, William K.; Petrelli, Robert; Piereth, Richard J.; Salchenberger, Samuel M.; Sehgal, Chander S.; and Verma, Mahendra K., 5,181,237, Cl. 379-88.000.

McCoy, David R.: *See*—
Sanderson, John R.; Crawford, Wheeler C.; and McCoy, David R., 5,180,866, Cl. 585-12.000.

McCrillis, Robert C.; Butts, Nelson L.; Ponder, Wade H.; and Abbott, James H., to United States of America, Environmental Protection Agency. Single chamber wood stove including gaseous hydrocarbon supply. 5,179,933, Cl. 126-77.000.

McDaniel, Bart R., to Intel Corporation. Resistorless trim amplifier using MOS devices for feedback elements. 5,180,988, Cl. 330-282.000.

McDonald, James, to Vitesse Semiconductor Corp. High speed logic circuit. 5,180,936, Cl. 307-348.000.

McEwen, Robert K.; and MacLeod, Alan D., to GEC-Marconi Limited. Display system with means for variably deflecting an array of optical emitters. 5,180,912, Cl. 250-234.000.

McGill, Terrence M., to Alliant Techsystems Inc. Shielded cathode ray tube. 5,180,947, Cl. 315-85.000.

McGregor, Allan K.: *See*—
Aldridge, Tod; Fitzgerald, John A.; McGregor, Allan K.; Quates, Ronald D.; Schoen, Rudolf R.; Thangarasu, Appavoo; and Vicic, John C., 5,180,008, Cl. 166-84.000.

McInroy, Nancy S.: *See*—
McInroy, Thomas R.; and McInroy, Nancy S., 5,180,306, Cl. 434-129.000.

McInroy, Thomas R.; and McInroy, Nancy S. Educational art game. 5,180,306, Cl. 434-129.000.

McLane-Goetz, Lee A. M.; Laramie, Matthew J.; McClelland, Kevin L.; McCormick, Robert L.; and Schultz, Allen L., to General Motors Corporation. Heat shield and deflector for engine cooling fan motor. 5,180,279, Cl. 415-177.000.

McLean, Kenneth W., to Ford New Holland, Inc. Agricultural machine with a cutterbar driven by a pair of generally vertical drive shafts. 5,179,822, Cl. 56-6.000.

McLeod, Jesse C., to Raque Food Systems, Inc. Flying shears with workpiece alignment device. 5,179,885, Cl. 83-315.000.

McMahon, Steven D.: *See*—
Hansen, Milton N.; and McMahon, Steven D., 5,180,297, Cl. 418-104.000.

McManigill, Douglass: *See*—
Young, James E.; McManigill, Douglass; and Lux, Jurgen A., 5,180,475, Cl. 204-180.100.

McMichael, Dannie L., to Kenney Manufacturing Company. Supporting bracket and headrail combination for a window blind. 5,180,130, Cl. 248-251.000.

McNamee, Thomas C. Low intensity RV light. 5,180,223, Cl. 362-223.000.

McQuigg, Donald W.; and Sowers, Edward E., to Reilly Industries, Inc. Highly selective chelating resins and monomers for their preparation. 5,180,822, Cl. 546-278.000.

McSymytz, Laurie L. Hot/dry, hot/moist or cold therapy pad. 5,179,944, Cl. 128-403.000.

McVicker, Gerard: *See*—
Karidis, John P.; McVicker, Gerard; and Pawletko, Joseph P., 5,180,955, Cl. 318-568.100.

Mead Corporation, The: *See*—
Bakx, Martinus C. M., 5,180,054, Cl. 206-140.000.

Medamana, John B.; Palmer, John W.; and Weber, Roy P., to AT&T Bell Laboratories. Authenticated communications access service. 5,181,238, Cl. 379-95.000.

Medtronic, Inc.: *See*—
Vegoe, Brett R.; and Molacek, Richard L., 5,180,372, Cl. 604-161.000.
Weiss, Douglas J.; Cretzmeyer, John W.; Crespi, Ann M.; Howard, William G.; and Skarstad, Paul M., 5,180,642, Cl. 429-90.000.

Meekins, Kris J.; and Benson, Jeffrey P., to Long Manufacturing Ltd. Circumferential flow heat exchanger. 5,179,999, Cl. 165-41.000.

Mehling, Horst, to Mannesmann Rexroth GmbH. Hydraulic machine having axial user ports. 5,180,296, Cl. 418-61.300.

Meier, Wolfgang: *See*—
Heinemann, Michael; Soeder, Bernhard; and Meier, Wolfgang, 5,180,948, Cl. 315-111.210.

Meister, Ronald J.: *See*—
Thiry, Steven A.; Meister, Ronald J.; and Ropp, David J., 5,180,019, Cl. 173-168.000.

Melber, George E.; Wolinski, Leon E.; and Oswald, William A., to Pierce & Stevens Corporation. Process for making dry microspheres. 5,180,752, Cl. 521-57.000.

Mellette, Robert R., to Binks Manufacturing Company. Hydraulically assisted high volume low pressure air spray gun. 5,180,104, Cl. 239-8.000.

Melter, Craig H., to Fiskars OY AB. All purpose scissors. 5,179,783, Cl. 30-262.000.

Melville, Robert C.: *See*—
Fang, San-Chin; Melville, Robert C.; and Trajkovic, Ljiljana, 5,181,179, Cl. 364-488.000.

Menard, Alan: *See*—
Pinkerton, Steven J.; and Menard, Alan, 5,180,413, Cl. 65-334.000.

Mende, Takayuki, to Mitsui Petrochemical Industries, Ltd.; and Uni-Charm Corporation. Nonwoven fabric comprising meltblown fibers having projections extending from the fabric base. 5,180,620, Cl. 428-138.000.

Mendelssohn, Marvin: *See*—
Smith, Robert M.; Ting, David M. T.; Boer, Jan H.; and Mendelssohn, Marvin, 5,181,162, Cl. 364-419.000.

Meneghelli, Barry J.: *See*—
Jeannotte, Anthony C.; Gilby, Anthony C.; Cheney, M. Charles; and Meneghelli, Barry J., 5,181,082, Cl. 356-436.000.

Mercedes-Benz AG: *See*—
Henke, Jurgen; Spinner, Erwin; and Fruh, Peter, 5,179,927, Cl. 123-549.000.

Mercier, Claude: *See*—
Jacquot, Roland; and Mercier, Claude, 5,180,855, Cl. 568-486.000.

Merck Patent Gesellschaft mit beschraenkter Haftung: *See*—
Eidenschink, Rudolf; Hopf, Reinhard; and Poetsch, Eike, 5,180,521, Cl. 252-299.610.

Heywang, Ulrich; Casutt, Michael; and Schwarz, Michael, 5,180,837, Cl. 548-315.400.
Merkenich, Karl: *See*—
Wahl, Friedrich; Maurer-Rothmann, Andrea; and Merkenich, Karl, 5,180,564, Cl. 423-309.000.
Merz+Co. GmbH & Co.: *See*—
Muller, Werner E. G.; Zahn, Rudolf K.; and Eich, Eckart, 5,180,748, Cl. 514-691.000.
Merzhanov, Alexandr G.; Xandopulo, Georgy I.; Nersesian, Mikael D.; Ismailov, Marat B.; and Borovinskaya, Inna P. Method of preparing refractory chromium-containing material. 5,180,698, Cl. 501-132.000.
Metal Flow Corporation: *See*—
Nolan, Christopher E.; Brown, Curtis M.; and DeVries, Jeffrey T., 5,180,266, Cl. 411-429.000.
Metcalfe, Raymond, to Atomic Energy of Canada Limited. Eccentric face seal with asymmetric closing force. 5,180,172, Cl. 277-27.000.
Metzger, William: *See*—
Buinevicius, Rimas P.; and Metzger, William, 5,179,952, Cl. 128-642.000.
Meyer, Philip G., to Jarvis Products Corporation. Automatic foot and hoof shear. 5,180,329, Cl. 452-166.000.
Meyer Tempco, Inc.: *See*—
Mistretta, Joseph L.; and Reyes, Jesus E., 5,180,593, Cl. 425-202.000.
Meyerson, Scott C.; Linder, William J.; and Maile, Keith R., to Cardiac Pacemakers, Inc. Acceleration-sensitive cardiac pacemaker and method of operation. 5,179,947, Cl. 128-419.0PG.
Michelin & Cie: *See*—
Schwarz, Martial, 5,180,002, Cl. 165-89.000.
Mick, Doron: *See*—
Berger, Josef; Mick, Doron; and Kleefeld, Joseph, 5,181,214, Cl. 372-34.000.
Microlys S.p.A.: *See*—
Motta, Carlo, 5,180,234, Cl. 400-124.000.
Micron Technology, Inc.: *See*—
Mitchell, Steven L.; and Farnworth, Warren M., 5,180,974, Cl. 324-158.00F.
Mighty Engineering Inc.: *See*—
Ogiso, Kenji, 5,180,042, Cl. 192-56.00R.
Mikata, Yuuichi; and Usami, Toshiro, to Kabushiki Kaisha Toshiba. Vertical field effect transistor with an extended polysilicon channel region. 5,181,088, Cl. 257-331.000.
Mikesell, Donald E.: *See*—
Wintersteen, Douglas C.; Hamilton, Lynn R.; Mikesell, Donald E.; and Sheets, Gerald R., 5,179,780, Cl. 29-890.070.
Mikhail, W. E. Michael. Method for implanting a patellar prosthesis. 5,180,384, Cl. 606-80.000.
Miki, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Privacy communication device. 5,181,246, Cl. 380-34.000.
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Masu, Kazuya, to Canon Kabushiki Kaisha. Deposited film formation method utilizing selective deposition by use of alkyl aluminum hydride. 5,180,687, Cl. 437-187.000.
Miler, Robert L.; and Abramovitz, Irwin J., to Westinghouse Electric Corp. False return signal apparatus. 5,181,036, Cl. 342-15.000.
Milina, Daniel V.: *See*—
Cook, Roger D.; and Milina, Daniel V., 5,180,467, Cl. 156-643.000.
Miller, Andrew: *See*—
Bowles, Stephen A.; Whittaker, Mark; and Miller, Andrew, 5,180,724, Cl. 514-248.000.
Whittaker, Mark; Miller, Andrew; and Bowles, Stephen A., 5,180,723, Cl. 514-234.200.
Miller, Clifford J. Automotive jumper cable apparatus. 5,180,310, Cl. 439-34.000.
Miller, Gregory A.: *See*—
Frantz, Brian H.; Jensen, Jack L.; and Miller, Gregory A., 5,180,188, Cl. 280-740.000.
Miller, James H.: *See*—
Petroff, Larry J.; and Miller, James H., 5,180,195, Cl. 285-231.000.
Miller, Larry D.: *See*—
Charles, Harlan W.; and Miller, Larry D., 5,180,186, Cl. 280-714.000.
Miller, Leroy J.: *See*—
Bak, Chan S.; Miller, Leroy J.; and Van Ast, Camille I., 5,179,993, Cl. 164-46.000.
Miller, Lois K.; and O'Reilly, David R., to University of Georgia Research Foundation, Inc. Biological insect control agents and methods of use. 5,180,581, Cl. 424-93.00A.
Miller, Robert A.; and Worden, Donald F., to Molex Incorporated. Shielded electrical connector. 5,180,316, Cl. 439-610.000.
Milliken Research Corporation: *See*—
Magee, Ronald, 5,179,749, Cl. 8-150.000.
Milner, Richard, to Smith & Nephew p.l.c. Gloves, their manufacture and use. 5,180,605, Cl. 427-2.000.
Minami, Kiyoshi: *See*—
Yamaguchi, Makoto; Hake, John; Okamura, Kazuo; and Minami, Kiyoshi, 5,180,494, Cl. 210-603.000.
Minamida, Isao: *See*—
Uneme, Hideki; Higuchi, Noriko; and Minamida, Isao, 5,180,833, Cl. 548-202.000.
Minamino, Kouji: *See*—
Okamoto, Mitsuo; Kodama, Hirokazu; and Minamino, Kouji, 5,181,160, Cl. 363-97.000.
Minarelli, Alessandro: *See*—
Osti, Roberto; and Minarelli, Alessandro, 5,179,814, Cl. 53-75.000.
Mine, Hideki: *See*—
Yamashita, Masami; Iwato, Noboru; Mine, Hideki; and Toshiaki, Wada, 5,181,151, Cl. 360-126.000.
Minegishi, Hiroshi: *See*—
Sano, Eiichi; and Minegishi, Hiroshi, 5,181,055, Cl. 354-62.000.
Ministry of International Trade and Industry: *See*—
Kamiya, Akira; and Nakano, Kikuo, 5,180,533, Cl. 264-65.000.
Minnesota Mining and Manufacturing Company: *See*—
Drake, Gerald E.; Gray, Thomas R.; and Izen, Paul G., 5,180,379, Cl. 606-32.000.
Fischer, Edward M., 5,180,409, Cl. 55-486.000.
Lovejoy, Michael W.; and Trice, Jennifer L., 5,179,852, Cl. 72-53.000.
Schwartzbauer, Neil J.; and Laska, Douglas J., 5,180,109, Cl. 239-346.000.
Smith, Terrance P.; Macomber, David W.; Chang, Jeffrey C.; and Williams, Linda K., 5,180,705, Cl. 503-227.000.
Minolta Camera Kabushiki Kaisha: *See*—
Araki, Kazuhiro, 5,181,073, Cl. 355-243.000.
Masuda, Toshiki, 5,181,070, Cl. 355-200.000.
Ogino, Shigeo; and Nishiyama, Masaaki, 5,181,127, Cl. 358-443.000.
Mishra, Umesh K.; and Trew, Robert J., to North Carolina State University. Method of making high current, high voltage breakdown field effect transistor. 5,180,681, Cl. 437-40.000.
Miskewitz, Regina M.: *See*—
Winston, Anthony E.; Miskewitz, Regina M.; Walley, Darlene R.; and Berschied, John R., 5,180,576, Cl. 424-52.000.
Mr. Gasket Company: *See*—
Foltz, Gilbert H., Jr.; and Harding, Stephen A., 5,179,919, Cl. 123-143.00C.
Mistretta, Joseph L.; and Reyes, Jesus E., to Meyer Tempco, Inc. Sheeter machine. 5,180,593, Cl. 425-202.000.
Mita Industrial Co., Ltd.: *See*—
Irie, Yoichiro, 5,180,152, Cl. 270-53.000.
Mita, Juniti: *See*—
Okabayashi, Makoto; Ishii, Masami; Mita, Juniti; and Shinagawa, Shigeo, 5,180,099, Cl. 228-263.140.
Mitani, Takahiko: *See*—
Sawai, Kiichi; Kurono, Masayasu; Mitani, Takahiko; Nagabuchi, Masanori; and Anzai, Keizo, 5,180,739, Cl. 514-491.000.
Mitchell, George E.; and Pelosi, Michael H., III, to Centercore, Inc. Air circulation system. 5,180,332, Cl. 454-230.000.
Mitchell, Steven L.; and Farnworth, Warren M., to Micron Technology, Inc. Semiconductor testing and shipping system. 5,180,974, Cl. 324-158.00F.
Mitsuba Electric Manufacturing Co., Ltd.: *See*—
Abe, Jun, 5,179,760, Cl. 15-250.130.
Mitsubishi Cable Industries, Ltd.: *See*—
Morita, Yukio; Zushi, Toshihiro; Matsuda, Nobuyoshi; Suga, Kaneharu; and Takai, Takuma, 5,180,754, Cl. 521-85.000.
Mitsubishi Denki K.K.: *See*—
Murata, Shigemi; and Ikeuchi, Masayuki, 5,180,983, Cl. 324-399.000.
Sugiyama, Takeshi, 5,181,002, Cl. 335-131.000.
Wakana, Takayuki; and Yamauchi, Satomi, 5,180,954, Cl. 318-369.000.
Yamashita, Shigeo, 5,181,003, Cl. 335-282.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Adachi, Etsushi; Adachi, Hiroshi; Mochizuki, Hiroshi; and Kanegae, Hirozoh, 5,180,691, Cl. 437-235.000.
Eimori, Takahisa; Wakamiya, Wataru; Ozaki, Hiroji; Tanaka, Yoshinori; and Satoh, Shinichi, 5,181,094, Cl. 257-372.000.
Fujihisa, Hiroaki; and Sogabe, Manabu, 5,181,001, Cl. 335-14.000.
Hayashi, Isamu; and Kondoh, Harufusa, 5,180,995, Cl. 331-57.000.
Inoue, Masato; Tajima, Minoru; Orime, Nobutake; and Katagi, Takashi, 5,181,040, Cl. 342-149.000.
Ito, Hiroki, 5,180,477, Cl. 204-298.050.
Miki, Tsutomu, 5,181,246, Cl. 380-34.000.
Murakami, Tadaki; Shirazawa, Takashi; and Kato, Kazuharu, 5,180,532, Cl. 264-60.000.
Murata, Shigemi; and Ikeuchi, Masayuki, 5,180,984, Cl. 324-399.000.
Sato, Yukio; Suzuki, Akihiro; Inoue, Mitsuo; Haruta, Kenyu; and Nagai, Haruhiko, 5,181,217, Cl. 372-38.000.
Wakamiya, Wataru; Tanaka, Yoshinori; Eimori, Takahisa; Ozaki, Hiroji; Kimura, Hiroshi; and Satoh, Shinichi, 5,180,683, Cl. 437-47.000.
Yagi, Tetsuya, 5,181,220, Cl. 372-45.000.
Yoshida, Naohito, 5,181,086, Cl. 257-18.000.
Zenshi, Yoshio, 5,180,097, Cl. 228-180.200.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Hiramatsu, Yasushi; Ishiuchi, Yukio; and Nagashima, Hiromitsu, 5,180,573, Cl. 423-584.000.
Sugihara, Yasuo; Komatsu, Toshio; Kashiba, Takashi; Hatakeyama, Hidetoshi; and Takeuchi, Teruo, 5,180,518, Cl. 252-188.280.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Kawada, Noriyuki; Morii, Shigeki; Nakashima, Motomi; Yamada, Jin; and Kaneko, Akitami, 5,180,048, Cl. 198-619.000.
Mitsubishi Materials Corporation: *See*—
Kikumoto, Nobuo; and Hayashi, Mineo, 5,180,422, Cl. 75-644.000.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Hayama, Kazuhide; Hata, Kazuyuki; Yamada, Katsuhiko; Abe, Keizo; and Ozu, Takahiro, 5,180,766, Cl. 524-315.000.
Terada, Masahiro; Sugimoto, Nobuji; Watanabe, Toshiro; and Sugimoto, Takashi, 5,180,629, Cl. 428-220.000.

Mitsuda, Satoshi: *See*—
Nishizawa, Kanji; Mitsuda, Satoshi; Komaki, Ryohei; Sugimoto, Masako; Sugiki, Chiaki; Ogami, Yasutaka; Sonoda, Kazumi; and Kishimoto, Fumitaka, 5,180,671, Cl. 435-136.000.

Mitsui-Cyanamid, Ltd.: *See*—
Akune, Kenichi; Watanabe, Naotaka; Inomiya, Yukihiro; Itoda, Hiroshi; Arai, Takeo; and Funato, Reiko, 5,180,473, Cl. 162-168.200.

Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See*—
Nakamura, Shuji; and Tamiya, Mitsuru, 5,180,198, Cl. 292-201.000.

Mitsui, Kiyoshi: *See*—
Abe, Hiroomi; Fujii, Takeshi; and Mitsui, Kiyoshi, 5,180,763, Cl. 524-112.000.

Mitsui Petrochemical Industries Ltd.: *See*—
Harazoe, Hirofumi; Shiromoto, Hiroyoshi; Yagi, Kazuo; and Kouya, Masahiro, 5,180,636, Cl. 428-373.000.
Matsunaga, Fujihisa; Fukuhara, Hiroshi; and Yasuhara, Mitsuki, 5,180,871, Cl. 585-400.000.
Mende, Takayuki, 5,180,620, Cl. 428-138.000.
Sakai, Hideki; and Yamamoto, Yohzoh, 5,180,767, Cl. 524-411.000.
Sigemoto, Hiromi, 5,180,768, Cl. 524-420.000.

Mitsui Petrochemnical Industries, Ltd.: *See*—
Taniguchi, Norio, 5,180,849, Cl. 562-414.000.

Mitsui, Tomonori: *See*—
Sugie, Noboru; Furukawa, Kenichi; Ogawa, Makoto; Kurisu, Hironori; Mitsui, Tomonori; Aito, Akio; Nakamura, Mitsunori; and Mochizuki, Hiroshi, 5,181,197, Cl. 369-75.100.

Mitsumi Electric Co., Ltd.: *See*—
Sugie, Noboru; Furukawa, Kenichi; Ogawa, Makoto; Kurisu, Hironori; Mitsui, Tomonori; Aito, Akio; Nakamura, Mitsunori; and Mochizuki, Hiroshi, 5,181,197, Cl. 369-75.100.

Mitsuyoshi, Matao: *See*—
Hama, Mamoru; Mitsuyoshi, Matao; and Hashimoto, Takahiro, 5,179,943, Cl. 128-368.000.

Miyabe, Masanori; Kohara, Hidekatsu; and Nakayama, Toshimasa, to Tokyo Ohka Kogyo Co., Ltd. Electron beam-curable resist composition and method for fine patterning using the same. 5,180,653, Cl. 430-296.000.

Miyagi, Takayasu, to Olympus Optical Co., Ltd. Endoscope provided in the insertable section with a flexible part which can be made linear. 5,179,935, Cl. 128-4.000.

Miyajima, Makoto: *See*—
Numao, Suteyoshi; and Miyajima, Makoto, 5,179,805, Cl. 51-149.000.

Miyake, Masahiko: *See*—
Sasaki, Takao; Fujibayashi, Kentaro; and Miyake, Masahiko, 5,181,178, Cl. 364-474.110.

Miyake, Norihisa: *See*—
Isowa, Yoshikazu; Sato, Yoshiaki; Nakashima, Yoshiharu; Masaki, Mitsuo; Miyake, Norihisa; Uehara, Masaki; and Hirate, Kenji, 5,180,712, Cl. 514-16.000.

Miyamoto, Yasuhiko, to Fuji Jukogyo Kabushiki Kaisha. Truck with a power spray device. 5,180,108, Cl. 239-172.000.

Miyanaga, Hirofumi: *See*—
Nagayoshi, Mitsugu; Miyazaki, Atsushi; Miyanaga, Hirofumi; Takehana, Sakae; Adachi, Hideyuki; Ueda, Yasuhiro; Fuse, Eiichi; and Aoki, Yoshisada, 5,179,934, Cl. 128-4.000.

Miyashita, Yukio; Ohno, Hiroshi; Noguchi, Kunio; and Fukuchi, Hironao, to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd, in English). Method of detecting deterioration of exhaust gas ingredient concentration sensor. 5,179,929, Cl. 123-688.000.

Miyazaki, Atsushi: *See*—
Nagayoshi, Mitsugu; Miyazaki, Atsushi; Miyanaga, Hirofumi; Takehana, Sakae; Adachi, Hideyuki; Ueda, Yasuhiro; Fuse, Eiichi; and Aoki, Yoshisada, 5,179,934, Cl. 128-4.000.

Miyazaki, Makoto: *See*—
Hayakawa, Yuichi; Iwakura, Takeshige; Tsutsui, Hiroshi; Hirano, Atsushi; and Miyazaki, Makoto, 5,181,150, Cl. 360-121.000.

Miyazaki, Takashi, to NEC Corporation. Discrete cosine transform circuit suitable for integrated circuit implementation. 5,181,183, Cl. 364-725.000.

Miyazawa, Yorikatu: *See*—
Kato, Toshio; Miyazawa, Yorikatu; Shibazaki, Osamu; and Goda, Yoshihiko, 5,179,855, Cl. 72-401.000.

Mizumori, Motoo: *See*—
Hikasa, Tadashi; Ibuki, Koichiro; Hamanaka, Tatsuo; and Mizumori, Motoo, 5,180,769, Cl. 524-525.000.

Mizuno, Masahiko: *See*—
Orimoto, Masaaki; Harase, Toshikatsu; and Mizuno, Masahiko, 5,179,871, Cl. 74-516.000.

Moberg, Victor L., to United States of America, Navy. Method of emitting on a specific wavelength Fraunhofer line using a neodymium doped laser transmitter. 5,181,212, Cl. 372-22.000.

Mobil Oil Corporation: *See*—
Forbus, Thomas R., 5,180,863, Cl. 585-7.000.

Mochizuki, Hiroshi: *See*—
Adachi, Etsushi; Adachi, Hiroshi; Mochizuki, Hiroshi; and Kanegae, Hirozoh, 5,180,691, Cl. 437-235.000.
Sugie, Noboru; Furukawa, Kenichi; Ogawa, Makoto; Kurisu, Hironori; Mitsui, Tomonori; Aito, Akio; Nakamura, Mitsunori; and Mochizuki, Hiroshi, 5,181,197, Cl. 369-75.100.

Mochizuki, Kouichi: *See*—
Nakajima, Satoshi; Mochizuki, Kouichi; Kobayashi, Hiroki; and Kohno, Yuji, 5,181,071, Cl. 355-203.000.

Moeller, Achim: *See*—
Doerper, Thomas; Moeller, Achim; Hillen, Heinz; Keilhauer, Gerhard; Emling, Franz; and Daum, Lothar, 5,180,811, Cl. 530-351.000.

Moh, Sang M.: *See*—
Han, Tack D.; and Moh, Sang M., 5,181,185, Cl. 364-760.000.

Mohamed Nasser: *See*—
Nasser, Gamal E. D., 5,180,560, Cl. 422-189.000.

Molacek, Richard L.: *See*—
Vegoe, Brett R.; and Molacek, Richard L., 5,180,372, Cl. 604-161.000.

Moldenhauer, Hermann, to A.U.K. Muller GmbH & Co. KG, Firma. Solenoid controlled servo valve. 5,180,138, Cl. 251-30.050.

Molecular Biosystems, Inc.: *See*—
Levene, Harold B.; Barnhart, James L.; and Widder, Kenneth J., 5,179,955, Cl. 128-662.020.

Molecular Devices Corporation: *See*—
Ghazarossian, Vartan; Kung, Viola T.; and Zuk, Robert F., 5,180,828, Cl. 546-37.000.

Moleculon Research Company: *See*—
Obermayer, Arthur S.; Hendrickson, James B.; and Hussoin, Sajjat, 5,180,821, Cl. 540-465.000.

Molex Incorporated: *See*—
Miller, Robert A.; and Worden, Donald F., 5,180,316, Cl. 439-610.000.

Moli Energy (1990) Limited: *See*—
Von Sacken, Ulrich, 5,180,574, Cl. 423-594.000.

Molins PLC: *See*—
Cahill, Michael J.; Patchett, Jeffrey J.; Seaward, David R.; Shirley, Graham L.; and Vernon, Geoffrey W., 5,179,815, Cl. 53-133.300.

Moller, Rudolf; Brausfeld, Walter; Gottling, Helmut; Scharnowski, Gerhard; and Muller, Peter, to Mannesmann Aktiengesellschaft. Fluidic connector strip with base plate modules and a solenoid valve for each module. 5,180,318, Cl. 439-716.000.

Momata, Kazuhiro: *See*—
Katsumata, Masao; Momata, Kazuhiro; Adachi, Kazuyoshi; Takeura, Tooru; Kitada, Masahiro; Kamo, Yoshihisa; and Yoshimatsu, Toshikane, 5,181,149, Cl. 360-119.000.

Monaghan, Samira E.: *See*—
Johnson, Kenneth M.; and Monaghan, Samira E., 5,180,504, Cl. 210-767.000.

Monfort, Inc.: *See*—
Davis, Albert D., 5,180,328, Cl. 452-128.000.

Monget, Daniel, to Bio Merieux. Microbiological analysis cup or the like. 5,180,555, Cl. 422-102.000.

Monigold, George E., Jr.: *See*—
Rowland, Bob G.; Monigold, George E., Jr.; Brendle, Robert L.; and Rosse, Francis V., 5,180,647, Cl. 429-252.000.

Monrose, Ernest W., III; and Monrose, Ernest W., IV. Detachable blades for ceiling fans. 5,180,284, Cl. 416-204.00R.

Monrose, Ernest W., IV: *See*—
Monrose, Ernest W., III; and Monrose, Ernest W., IV, 5,180,284, Cl. 416-204.00R.

Monsanto Company: *See*—
Padwa, Allen R.; Lavengood, Richard E.; and Patel, Raman, 5,180,777, Cl. 525-66.000.

Monsanto Kasei Company: *See*—
Kamoshita, Ryuji; Kashiwagi, Hiroki; and Takimoto, Koji, 5,180,779, Cl. 525-87.000.

Monsees, John C.; Crownover, Joseph W.; and Burer, Aubrey M., to BMC Technology Corporation. Process of manufacturing multilayer ceramic capacitors. 5,179,773, Cl. 29-25.420.

Montalbano, Henry. Pizza packaging system. 5,180,075, Cl. 220-403.000.

Monteil, Andre J.: *See*—
Carlier, Patrick; Combourieu, Michel; Poisson, Claude; and Monteil, Andre J., 5,180,726, Cl. 514-252.000.

Montijo, B. Allen, to Hewlett-Packard Company. Method and apparatus for increasing throughput in random repetitive digitizing systems. 5,180,971, Cl. 324-121.00R.

Moon, Seung H.; and Yoon, Yung S., to Samsung Electronics Co., Ltd. Compound semiconductor device with bipolar transistor and laser diode. 5,181,085, Cl. 257-94.000.

Moore, Earl P., to Du Pont de Nemours, E. I., and Company. Tablet formulations of pesticides. 5,180,587, Cl. 424-408.000.

Moore, George E.; and Tweardy, Lisa A. G., to Jerome Group Inc., The. Antidecubitus immobilization cervical collar. 5,180,361, Cl. 602-18.000.

Moore, Henry J., Jr.; Gidanian, Bijan; and Deneau, Myron E., to Mor-Flo Industries, Inc. Forced draft water heater with an improved tank structure and a method for making water heaters. 5,179,914, Cl. 122-17.000.

Moore, Mansel: *See*—
Clough, Peter S.; Yeowart, Richard J.; and Moore, Mansel, 5,179,752, Cl. 14-73.000.

Mor-Flo Industries, Inc.: *See*—
Moore, Henry J., Jr.; Gidanian, Bijan; and Deneau, Myron E., 5,179,914, Cl. 122-17.000.

Morand, Peter; Arnason, John T.; Philogene, Bernard J. R.; MacEachern, Anita M.; Leitch, Leonard C.; and Kaminski, Jerzy, to Her Majesty the Queen as represented by the Minister of National Defense of Her Majesty's Canadian Government. Phototoxic compounds for use as insect control agents. 5,180,838, Cl. 549-59.000.

More, Georgina, to Motorola, Inc. Integral solid state embedded power supply. 5,180,645, Cl. 429-127.000.

Moreau, Christian; Lamontagne, Mario; and Cielo, Paolo, to National Research Council of Canada. Method and apparatus for monitoring the temperature and velocity of plasma sprayed particles. 5,180,921, Cl. 250-554.000.

Morel, Philippe: *See*—
Guerin, Jean-Claude; and Morel, Philippe, 5,181,098, Cl. 358-10.000.

Moreno, Ricardo H., to General Motors Corporation. Vehicle steering column installation. 5,180,189, Cl. 280-779.000.

Morgan, Constance H.: *See*—
Losee, D. Bruce; Morgan, Constance H.; Sprinkel, F. Murphy; and Utsch, Francis V., 5,179,966, Cl. 131-351.000.

Morgan, Jerry L.; Frisch, Alan M.; and Hinrichs, Erhard W., to Motorola, Inc. Natural language generation system for producing natural language instructions. 5,181,250, Cl. 381-51.000.

Mori, Hideo: *See*—
Ueta, Koki; Kamada, Naoki; Mori, Hideo; Endo, Suehiro; and Tajima, Susumu, 5,179,864, Cl. 74-7.00A..

Mori, Katsumi; Asaka, Tatsuya; and Iwano, Hideaki, to Seiko Epson Corporation. Surface emission type semiconductor laser. 5,181,219, Cl. 372-45.000.

Mori, Katsumi; Asaka, Tatsuya; and Iwano, Hideaki, to Seiko Epson Corporation. Surface emission type semiconductor laser. 5,181,221, Cl. 372-46.000.

Mori, Kazunori, to Nissan Motor Company, Limited. Rear wheel steering angle control system for vehicle. 5,180,026, Cl. 180-140.000.

Morifusa, Harumi: *See*—
Kitayama, Minoru; Morifusa, Harumi; and Kondoh, Katsumi, 5,180,776, Cl. 525-64.000.

Morihiro, Naoki: *See*—
Tsuchimoto, Yoshihiro; Ikezawa, Toshikazu; Morihiro, Naoki; and Shimizu, Naoya, 5,180,412, Cl. 65-66.000.

Morii, Shigeki: *See*—
Kawada, Noriyuki; Morii, Shigeki; Nakashima, Motomi; Yamada, Jin; and Kaneko, Akitami, 5,180,048, Cl. 198-619.000.

Morikawa, Seiichiro, to Fuji Photo Film Co., Ltd. Method for determining amounts of UCR and image processing apparatus. 5,181,068, Cl. 355-77.000.

Morimoto, Eiichi, to Murata Kikai Kabushiki Kaisha. Reading device for facsimile apparatus. 5,181,126, Cl. 358-426.000.

Morishima, Satoshi; and Chidiiwa, Sakae, to Ishikawajima-Harima Heavy Industries Co., Ltd. Plate type reformer assembly. 5,180,561, Cl. 422-191.000.

Morita, Nobuo: *See*—
Fuh, Giin-Fa; Morita, Nobuo; Whitfill, Donald L.; and Strah, David A., 5,180,020, Cl. 175-72.000.

Morita, Takashi: *See*—
Motoki, Yuko; Honda, Akinori; and Morita, Takashi, 5,181,199, Cl. 370-60.000.

Morita, Yukio; Zushi, Toshihiro; Matsuda, Nobuyoshi; Suga, Kaneharu; and Takai, Takuma, to Mitsubishi Cable Industries, Ltd. Polymer composition for foam molding. 5,180,754, Cl. 521-85.000.

Moriya, Iwao; Sugie, Masayuki; Iwasaki, Masayoshi; and Sakata, Junichiro, to Asahi Denka Kogyo Kabushiki Kaisha. Process for producing bakery product having layered structure. 5,180,603, Cl. 426-556.000.

Moser, Hans: *See*—
Pissiotas, Georg; Moser, Hans; Brunner, Hans-Georg; and Steiner, Eginhard, 5,180,418, Cl. 504-193.000.

Mosher, Dan M.; Latham, Larry; Todd, Bob; Blanton, Cornelia H.; Trogolo, Joe R.; and Cotton, David R., to Texas Instruments Incorporated. Complementary bipolar and MOS transistor having power and logic structures on the same integrated circuit substrate. 5,181,095, Cl. 257-370.000.

Mosher, Douglas E.: *See*—
Piccolo, Joseph R., Sr.; Swilling, William H., Jr.; Kearney, Michael R.; and Mosher, Douglas E., 5,180,225, Cl. 366-147.000.

Moslehi, Mehrdad M., to Texas Instruments Incorporated. Method and apparatus for precise temperature measurement. 5,180,226, Cl. 374-127.000.

Moss, Kevin D.: *See*—
Daw, Terry L.; Procter, David F.; and Moss, Kevin D., 5,180,331, Cl. 454-187.000.

Motobayashi, Noriko: *See*—
Yokoyama, Hitoshi; Sawamura, Norio; and Motobayashi, Noriko, 5,180,596, Cl. 426-36.000.

Motoki, Yuko; Honda, Akinori; and Morita, Takashi, to Hitachi, Ltd. Packet switching system. 5,181,199, Cl. 370-60.000.

Motora, Yuichi: *See*—
Yoshioka, Ritsuo; Ueda, Makoto; Motora, Yuichi; and Nakamura, Mitsuharu, 5,180,544, Cl. 376-333.000.

Motorola, Inc.: *See*—
Abdi, Behrooz; and Stuhlmiller, Gary, 5,180,935, Cl. 307-524.000.
Bresin, Mark S.; Aksoy, Adnan; and Robinson, Michael, 5,180,644, Cl. 429-98.000.
DeLuca, Michael J.; Erhart, Richard A.; and DeLuca, Joan S., 5,181,227, Cl. 375-95.000.
Derfiny, Dennis, 5,181,263, Cl. 385-24.000.
Dworsky, Lawrence N.; Jaskie, James E.; and Kane, Robert C., 5,180,951, Cl. 315-169.300.
Gutteridge, Ronald J.; and Ristic, Ljubisa, 5,181,156, Cl. 361-283.000.
Marozsan, Andrew; and Peana, Daniel, 5,180,248, Cl. 403-13.000.
Marvin, Dennis F.; and Hernandez-Solis, Maria, 5,180,942, Cl. 310-346.000.
More, Georgina, 5,180,645, Cl. 429-127.000.
Morgan, Jerry L.; Frisch, Alan M.; and Hinrichs, Erhard W., 5,181,250, Cl. 381-51.000.

Motta, Carlo, to Microlys S.p.A. Dot matrix printing head for high-definition or high-speed printing. 5,180,234, Cl. 400-124.000.

Moureaux, Patrick; and Darnanville, Jean P., to Shell Oil Company. Process for extruding crystalline aluminosilicates. 5,180,701, Cl. 502-64.000.

Mouret, Michel, to SGS-Thomson Microelectronics S.A. Interpolation analog/digital converter. 5,181,035, Cl. 341-161.000.

Moussalli, Francis S. Method for warping using progressively controlled tension on a dye beam. 5,179,750, Cl. 8-155.100.

MTU Motoren- und Turbinen-Union, Friedrichshafen: *See*—
Schonfeld, Dieter, 5,179,916, Cl. 123-48.00B.

MTU Motoren-Undturbinen-Union Munchen GmbH: *See*—
Hanser, Hagen; and Grieb, Hubert, 5,180,249, Cl. 403-28.000.

Mugrage, Benjamin B.: *See*—
Kump, Wilhelm; Borel, Christian; Chen, Jen; Veenstra, Siem J.; Francis, John; and Mugrage, Benjamin B., 5,180,718, Cl. 514-183.000.

Mulhorn, Fred M., to Foseco International Limited. Hot top lining assembly for ingot moulds. 5,180,506, Cl. 249-197.000.

Muller, Manfred; Henseler, Wolfgang; Katz, Egon; Bossenmaier, Alban; and Hamm, Dietrich, to Daimler-Benz AG. Cover for an airbag unit and the process for producing it. 5,180,187, Cl. 280-732.000.

Muller, Peter: *See*—
Moller, Rudolf; Brausfeld, Walter; Gottling, Helmut; Scharnowski, Gerhard; and Muller, Peter, 5,180,318, Cl. 439-716.000.

Muller, Werner E. G.; Zahn, Rudolf K.; and Eich, Eckart, to Merz+Co. GmbH & Co. Avarone and its pharmaceutical compositions and use as an antiviral agent. 5,180,748, Cl. 514-691.000.

Munro, William A. Method and apparatus for monitoring and maintaining an optimum balance between the main phases of a multi-phase multiple load local electrical distribution system. 5,181,180, Cl. 364-492.000.

Murai, Kazuhiro; and Takada, Shun, to Konica Corporation. Photosensitive silver halide photographic material. 5,180,659, Cl. 430-623.000.

Murakami, Tadaki; Shirazawa, Takashi; and Kato, Kazuharu, to Mitsubishi Denki Kabushiki Kaisha. Process for preparing mica-containing ceramic composite. 5,180,532, Cl. 264-60.000.

Muramatsu, Atsuhi, to Tokai Rubber Industries, Ltd. Fluid-filled elastic mount having two orifices passages one of which is selectively opened and closed by means of vacuum pressure. 5,180,148, Cl. 267-140.140.

Muramatsu, Tadao: *See*—
Inoue, Hiroshi; Takabayashi, Seiichirou; Muramatsu, Tadao; Funagoshi, Tsutomu; and Hirano, Tetsuji, 5,180,627, Cl. 428-214.000.

Muraoka, Kyouji: *See*—
Uryu, Masaru; Tokura, Kunihiko; and Muraoka, Kyouji, 5,180,785, Cl. 525-240.000.

Murase, Kiyoshi: *See*—
Mase, Toshiyasu; Tsuzuki, Ryuji; Hara, Hiromu; Murase, Kiyoshi; and Tomioka, Kenichi, 5,180,730, Cl. 514-348.000.

Murata Kikai Kabushiki Kaisha: *See*—
Morimoto, Eiichi, 5,181,126, Cl. 358-426.000.
Nishioka, Yoshiyuki, 5,180,269, Cl. 414-331.000.

Murata Mfg. Co., Ltd.: *See*—
Sakuragi, Satoshi; Ikeda, Takeshi; and Kuroda, Takashi, 5,181,240, Cl. 379-98.000.
Shigeno, Yoshiharu; Murata, Michihiro; and Nishino, Yu, 5,180,903, Cl. 235-449.000.

Murata, Michihiro: *See*—
Shigeno, Yoshiharu; Murata, Michihiro; and Nishino, Yu, 5,180,903, Cl. 235-449.000.

Murata, Shigemi; and Ikeuchi, Masayuki, to Mitsubishi Denki K.K. Ignition plug for an internal combustion engine provided with an ionization current detector electrode. 5,180,983, Cl. 324-399.000.

Murata, Shigemi; and Ikeuchi, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Ion current sensing device for an internal combustion engine with spurious voltage preventing filter. 5,180,984, Cl. 324-399.000.

Murata, Toshinori: *See*—
Nakagaki, Nobufumi; Kurita, Toshiyuki; Murata, Toshinori; Kaizaki, Kazuhiro; Kubota, Sadao; Kamiya, Masanori; Sekiya, Hiroshi; and Fujiwara, Kenichi, 5,181,116, Cl. 358-159.000.

Murata, Yuzo: *See*—
Ishibashi, Satoru; Nakamura, Kyuzo; Higuchi, Yasushi; Komatsu, Takashi; Murata, Yuzo; and Ota, Yoshifumi, 5,180,476, Cl. 204-192.290.

Murphy, David T.: *See*—
Haugen, Ronald E.; and Murphy, David T., 5,180,274, Cl. 414-427.000.

Murphy, James A.: *See*—
Backer, Marcella R.; Cavender, Ralston R., Jr.; Jones, Peter C.; and Murphy, James A., 5,180,411, Cl. 65-3.120.

Murugan, Muthu K., to Allied-Signal Inc. Bi-directional PWM converter. 5,181,169, Cl. 363-17.000.

Murunaka & Co., Ltd.: *See*—
Numao, Suteyoshi; and Miyajima, Makoto, 5,179,805, Cl. 51-149.000.

Myers, Terry D.: *See*—
Vassiliadis, Arthur; Shaffer, Joseph W.; Fullmer, David J.; Brewer, Michael H.; Hennings, David R.; and Myers, Terry D., 5,180,304, Cl. 433-224.000.

Nabi, Nuran: *See*—
Gaffar, Abdul; Nabi, Nuran; Afflitto, John; and Stringer, Orum, 5,180,578, Cl. 474-52.000.
Naef, Ferdinand; Decorzani, Rene ; Naef, Regula; Blanc, Pierre-Alain; and van Beem, Nicole, to Firmenich S.A. Ethyl (2E,4Z,7Z)-2,4,7-decatrienoate and its use as a perfuming or flavoring ingredient. 5,180,710, Cl. 512-26.000.
Naef, Regula: *See*—
Naef, Ferdinand; Decorzani, Rene ; Naef, Regula; Blanc, Pierre-Alain; and van Beem, Nicole, 5,180,710, Cl. 512-26.000.
Nagabuchi, Masanori: *See*—
Sawai, Kiichi; Kurono, Masayasu; Mitani, Takahiko; Nagabuchi, Masanori; and Anzai, Keizo, 5,180,739, Cl. 514-491.000.
Nagai, Haruhiko: *See*—
Sato, Yukio; Suzuki, Akihiro; Inoue, Mitsuo; Haruta, Kenyu; and Nagai, Haruhiko, 5,181,217, Cl. 372-38.000.
Nagai, Katsutoshi: *See*—
Kobayshi, Takeo; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, 5,181,060, Cl. 354-238.100.
Nagao, Makoto; and Terada, Keiji, to Kabushki Kaisha Komatsu Seisakusho. Linear pattern recognizing method. 5,181,258, Cl. 382-28.000.
Nagao, Takashi, to Fuji Xerox Co., Ltd. An image processing apparatus for detecting the boundary of an object displayed in digital image. 5,181,261, Cl. 382-48.000.
Nagaoka, Akinobu: *See*—
Goto, Giichi; Nagaoka, Akinobu; and Ishihara, Yuji, 5,180,746, Cl. 514-654.000.
Nagasaki, Hideo; Inui, Naoki; Yachigo, Shinichi; Abe, Hiroomi; Fujii, Takeshi; and Yamamoto, Masashi, to Sumitomo Chemical Company, Limited. Stabilized polypropylene resin compositions containing a dinitrodiamine compound. 5,180,764, Cl. 524-260.000.
Nagashima, Akira, to Kioritz Corporation. Chain saw guide plate. 5,179,785, Cl. 30-382.000.
Nagashima, Hiromitsu: *See*—
Hiramatsu, Yasushi; Ishiuchi, Yukio; and Nagashima, Hiromitsu, 5,180,573, Cl. 423-584.000.
Nagashima, Masayuki, to Hirose Electric Co., Ltd. Surface-mounted high-frequency coaxial connector. 5,180,315, Cl. 439-581.000.
Nagashima, Nobuyoshi: *See*—
Matsumoto, Toshio; Yasuda, Shuhei; Kusada, Tokutarou; and Nagashima, Nobuyoshi, 5,181,121, Cl. 358-236.000.
Nagata, Kosei: *See*—
Iwade, Takashi; and Nagata, Kosei, 5,179,764, Cl. 19-245.000.
Nagayoshi, Mitsugu; Miyazaki, Atsushi; Miyanaga, Hirofumi; Takehana, Sakae; Adachi, Hideyuki; Ueda, Yasuhiro; Fuse, Eiichi; and Aoki, Yoshisada, to Olympus Optical Co., Ltd. Endoscope. 5,179,934, Cl. 128-4.000.
Nakagaki, Nobufumi; Kurita, Toshiyuki; Murata, Toshinori; Kaizaki, Kazuhiro; Kubota, Sadao; Kamiya, Masanori; Sekiya, Hiroshi; and Fujiwara, Kenichi, to Hitachi, Ltd.; and Hitachi Video Engineering, Inc. Television receiver with control of writing and reading of video memory. 5,181,116, Cl. 358-159.000.
Nakagawa, Satoru: *See*—
Itaya, Hisao; Akebi, Kazuhiko; Okabe, Minoru; and Nakagawa, Satoru, 5,181,030, Cl. 341-20.000.
Nakahara, Shohei: *See*—
Abys, Joseph A.; Kadija, Igor V.; Maisano, Joseph J., Jr.; and Nakahara, Shohei, 5,180,482, Cl. 205-224.000.
Nakajima, Hiroyuki; and Kaji, Hiroyuki, to Hitachi, Ltd. Method and apparatus for generating and/or updating cooccurrence relation dictionary. 5,181,163, Cl. 364-419.000.
Nakajima, Satoshi; Mochizuki, Kouichi; Kobayashi, Hiroki; and Kohno, Yuji, to Yamanashi Electronics Co., Ltd.; and Shindengen Electric Manufacturing Co., Ltd. Apparatus for evaluating characteristics of photosensitive drum for electrophotography. 5,181,071, Cl. 355-203.000.
Nakamatsu, Shuji: *See*—
Nishiki, Yoshinori; Sawamoto, Isao; Nakamatsu, Shuji; and Shimamune, Takayuki, 5,180,502, Cl. 210-748.000.
Nakamoto, Funiaki: *See*—
Umeda, Kazuyoshi; and Nakamoto, Funiaki, 5,180,525, Cl. 252-609.000.
Nakamura, Ei; Sasaki, Mitsuo; and Nakamura, Hiromi, to Kabushiki Kaisha Toshiba; and Toshiba Machine Co., Ltd. Method of forming modified portion and magnetic recording member using this method. 5,180,609, Cl. 427-595.000.
Nakamura, Hiromi: *See*—
Nakamura, Ei; Sasaki, Mitsuo; and Nakamura, Hiromi, 5,180,609, Cl. 427-595.000.
Nakamura, Kanji: *See*—
Katou, Susumu; and Nakamura, Kanji, 5,180,416, Cl. 504-136.000.
Nakamura, Kimio: *See*—
Sato, Koji; Suzuki, Tokio; Kamiya, Hajime; Nakamura, Kimio; Kosaka, Masahisa; and Ohsora, Tetsuo, 5,181,141, Cl. 359-580.000.
Nakamura, Kyuzo: *See*—
Ishibashi, Satoru; Nakamura, Kyuzo; Higuchi, Yasushi; Komatsu, Takashi; Murata, Yuzo; and Ota, Yoshifumi, 5,180,476, Cl. 204-192.290.
Nakamura, Minoru: *See*—
Kasai, Minoru; and Nakamura, Minoru, 5,180,327, Cl. 452-47.000.
Nakamura, Mitsuharu: *See*—
Yoshioka, Ritsuo; Ueda, Makoto; Motora, Yuichi; and Nakamura, Mitsuharu, 5,180,544, Cl. 376-333.000.
Nakamura, Mitsunori: *See*—
Sugie, Noboru; Furukawa, Kenichi; Ogawa, Makoto; Kurisu, Hironori; Mitsui, Tomonori; Aito, Akio; Nakamura, Mitsunori; and Mochizuki, Hiroshi, 5,181,197, Cl. 369-75.100.
Nakamura, Morio; Yamamoto, Takushi; Tanaka, Hitoshi; Ozawa, Hitoshi; and Shimada, Yasuhiro, to Sumitomo Seika Chemicals Co., Ltd. Process for production of water-absorbent resin. 5,180,798, Cl. 526-66.000.
Nakamura, Shinichi; Tubokura, Yutaka; and Terada, Eiichi, to Idemitsu Petrochemical Company Limited. Rubber-modified styrene-based copolymer. 5,180,780, Cl. 525-96.000.
Nakamura, Shuji; and Tamiya, Mitsuru, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Motor driven lock device for trunk lid and the like. 5,180,198, Cl. 292-201.000.
Nakamura, Takashi, to Fuji Photo Film Co., Ltd. Photographic picture-taking film processing. 5,180,648, Cl. 430-21.000.
Nakamura, Yoshizo; Oyabu, Kenzo; and Tomozawa, Nakanori, to Tokai Co., Ltd. Device for straightening one edge of rectangular sheet. 5,179,795, Cl. 38-143.000.
Nakane, Mototaka; and Kobayashi, Kiyonori, to Aisin Seiki Kabushiki Kaisha. Torque variation absorbing device provided with elastic elements and grooved plates for receiving rotational elements. 5,180,334, Cl. 464-35.000.
Nakano, Eiichi: *See*—
Sando, Yoshiteru; Nakano, Eiichi; and Ishidoshiro, Hiroshi, 5,180,497, Cl. 210-665.000.
Nakano, Kikuo: *See*—
Kamiya, Akira; and Nakano, Kikuo, 5,180,533, Cl. 264-65.000.
Nakashima, Motomi: *See*—
Kawada, Noriyuki; Morii, Shigeki; Nakashima, Motomi; Yamada, Jin; and Kaneko, Akitami, 5,180,048, Cl. 198-619.000.
Nakashima, Ryuji: *See*—
Harada, Chikao; Kawamura, Norio; Nakashima, Ryuji; Takahashi, Arihiro; Yamazaki, Toshimasa; Yasui, Masanobu; and Kondo, Tatsushi, 5,179,956, Cl. 128-672.000.
Nakashima, Yoshiharu: *See*—
Isowa, Yoshikazu; Sato, Yoshiaki; Nakashima, Yoshiharu; Masaki, Mitsuo; Miyake, Norihisa; Uehara, Masaki; and Hirate, Kenji, 5,180,712, Cl. 514-16.000.
Nakatani, Isao; Ozawa, Kiyosho; Hijikata, Masayuki; and Takahashi, Tsutomu, to National Research Institute for Metals. Method of manufacturing fine-particle colloid or magnetic fluid. 5,180,512, Cl. 252-62.510.
Nakatsuji, Tadao: *See*—
Yoshimoto, Masafumi; Nakatsuji, Tadao; and Yoshida, Kimihiko, 5,180,567, Cl. 423-239.000.
Nakayama, Jun: *See*—
Shindo, Hitoshi; and Nakayama, Jun, 5,181,132, Cl. 359-58.000.
Nakayama, Toshimasa: *See*—
Miyabe, Masanori; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,180,653, Cl. 430-296.000.
Nakazawa, Chiharu: *See*—
Yamaoka, Fumiyuki; Sasaki, Mitsuo; Nakazawa, Chiharu; and Sugiyama, Hiroyuki, 5,180,129, Cl. 248-230.000.
Nakazawa, Hideo: *See*—
Yamaguchi, Toru; Inazuki, Yukio; and Nakazawa, Hideo, 5,180,554, Cl. 422-86.000.
Namiyama, Kazuyoshi: *See*—
Tsurutani, Kazushi; Hosogai, Daijiro; Kokubo, Kakuro; Kobayashi, Taiji; Higashimoto, Noboru; Endoh, Masami; Namiyama, Kazuyoshi; and Yoneda, Makoto, 5,179,923, Cl. 123-435.000.
Narishima, Ryousuke; Ogiri, Tetsuo; Kawamura, Youji; and Iwakawa, Hiroaki, to Onoda Cement Co. Ltd. Straightening instrument and cyclone. 5,180,257, Cl. 406-173.000.
Nasco International, Inc.: *See*—
Niemeyer, William P., 5,180,229, Cl. 383-91.000.
Nasser, Gamal E. D., to Mohamed Nasser. Apparatus for dehydrogenation of liquid hydrides. 5,180,560, Cl. 422-189.000.
Natansohn, Samuel: *See*—
Lai, Wen-Chao; Rourke, William J.; and Natansohn, Samuel, 5,180,563, Cl. 423-21.500.
Nath, Prem: *See*—
DiDio, Gary M.; Jones, Kermit; Hoffman, Kevin; Laarman, Timothy; Call, Jon; and Nath, Prem, 5,180,434, Cl. 118-718.000.
Nathan, Henry: *See*—
Sufrin, Janice R.; Bacchi, Cyrus J.; Porter, Carl W.; Nathan, Henry; Spiess, Arthur J.; and Yarlett, Nigel, 5,180,714, Cl. 514-46.000.
National Institute for Research in Inorganic Materials: *See*—
Terada, Yasuhiko; Abe, Kazunobu; Uno, Hajime; and Shirasaki, Shinichi, 5,180,699, Cl. 501-134.000.
National Research Council of Canada: *See*—
Moreau, Christian; Lamontagne, Mario; and Cielo, Paolo, 5,180,921, Cl. 250-554.000.
National Research Institute for Metals: *See*—
Nakatani, Isao; Ozawa, Kiyosho; Hijikata, Masayuki; and Takahashi, Tsutomu, 5,180,512, Cl. 252-62.510.
National Science Council: *See*—
Shiao, Shin-Jen, 5,180,761, Cl. 523-213.000.
Yeh, Edge C.; and Wang, Jiunn Y., 5,180,214, Cl. 303-111.000.
National Semiconductor Corporation: *See*—
Kertis, Robert A., 5,181,205, Cl. 371-21.100.
Mayes, Michael K., 5,180,930, Cl. 307-353.000.
Natwick, Vernon R.; Lawless, Michael W.; Doll, Joseph E.; and Wu, Chung-You C., to Abbott Laboratories. Method for monitoring fluid flow from a volumetric pump. 5,180,287, Cl. 417-43.000.

Navistar International Transportation Corp.: *See*—
Bender, Burnell L., 5,179,920, Cl. 123-198.0DB.
Nazmy, Mohamed Y., to Asea Brown Boveri Ltd. Process for the production of longitudinally-directed coarse-grained columnar crystals in a workpiece consisting of an oxide-dispersion-hardened nickel-based superalloy. 5,180,451, Cl. 148-675.000.
Neal, Christopher S.: *See*—
Oswald, Gordon K. A.; Neal, Christopher S.; and Richardson, Alan T., 5,181,039, Cl. 342-119.000.
NEC America Inc.: *See*—
Wendt, Rolf H. G., 5,180,987, Cl. 328-14.000.
NEC Corporation: *See*—
Esaki, Takafumi, 5,181,099, Cl. 358-21.00R.
Fujii, Masahiro, 5,181,023, Cl. 340-825.460.
Hayakawa, Yuichi; Iwakura, Takeshige; Tsutsui, Hiroshi; Hirano, Atsushi; and Miyazaki, Makoto, 5,181,150, Cl. 360-121.000.
Hirose, Yutaka; Yamanaka, Yutaka; and Okanoue, Kazuhiro, 5,181,161, Cl. 369-48.000.
Kawaura, Hisao, 5,181,093, Cl. 257-223.000.
Miyazaki, Takashi, 5,181,183, Cl. 364-725.000.
Nose, Tadashi, 5,180,965, Cl. 323-275.000.
Sugawara, Michinori; and Takahashi, Hiroyuki, 5,180,966, Cl. 323-308.000.
Suzuki, Toshiya, 5,179,777, Cl. 29-848.000.
Nedbal, Ralph G., to Illinois Tool Works Inc. Hydrometer collar improvement. 5,180,643, Cl. 429-91.000.
Neeser, Fredy D.; Hufschmid, Markus D.; and Ruprecht, Jurg P., to Ascom Tech. AG. Receiver for a DSSS signal. 5,181,225, Cl. 375-1.000.
Negele, Michael: *See*—
Schwarz, Hans-Helmut; Braden, Rudolf; Marhold, Albrecht; and Negele, Michael, 5,180,861, Cl. 570-160.000.
Neilson, Jeffrey M., to Varian Associates, Inc. Gyrotron with a mode convertor which reduces EM wave leakage. 5,180,944, Cl. 315-5.000.
Nelson Steel: *See*—
Mattiussi, Albert S., 5,179,967, Cl. 134-60.000.
Nemoto, Mitsugu; Koizumi, Noboru; and Okazaki, Shigeru, to Konica Corporation. Toner replenishing device. 5,181,074, Cl. 355-245.000.
Nemoto, Peter A.: *See*—
Wettlaufer, David G.; Shutske, Gregory M.; and Nemoto, Peter A., 5,180,834, Cl. 548-241.000.
Nersesian, Mikael D.: *See*—
Merzhanov, Alexandr G.; Xandopulo, Georgy I.; Nersesian, Mikael D.; Ismailov, Marat B.; and Borovinskaya, Inna P., 5,180,698, Cl. 501-132.000.
Neste OY: *See*—
Takakarhu, Jouni, 5,180,558, Cl. 422-131.000.
Neu, Max G.; and Gough, Michael J., to Foseco International Limited. Exothermic compositions. 5,180,759, Cl. 523-141.000.
Neubauer, Hans-Juergen: *See*—
Leyendecker, Joachim; Neubauer, Hans-Juergen; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; and Krieg, Wolfgang, 5,180,727, Cl. 514-255.000.
Neumann, Donald E.: *See*—
Schauss, Craig A.; Neumann, Donald E.; and Bielawski, Dennis A., 5,181,201, Cl. 370-85.100.
Neurodynamics, Inc.: *See*—
Ghajar, Jamshid B. G.; Hariri, Robert J.; and Ghadjar, Fathali G., 5,180,387, Cl. 604-266.000.
New England Biolabs, Inc.: *See*—
Wilson, Geoffrey G.; and Nwankwo, Donald, 5,180,673, Cl. 435-199.000.
Newman, Kenneth B.: *See*—
Lyman, Tommy L.; and Newman, Kenneth B., 5,179,844, Cl. 62-503.000.
Newsome, Reginald W.: *See*—
Adams, John M.; Chance, Christopher N.; DeBlasio, James A.; Evers, Donald H.; Kirby, Michael A., Sr.; Newsome, Reginald W.; and Talley, Robert E., 5,180,056, Cl. 206-256.000.
Chance, Christopher N.; DeBlasio, James A.; Evers, Donald H.; Harris, William C., Jr.; Kirby, Michael A., Sr.; Newsome, Reginald W.; and Talley, Robert E., 5,180,055, Cl. 206-256.000.
Ngo, Viet H.; Poole, Warren D.; Hancock, Sean J.; and France, Timothy T., to Lemna Corporation, The. Floating aquatic plant water treatment system. 5,180,501, Cl. 210-747.000.
Nguyen, Dat: *See*—
Barrett, Dale R.; Nguyen, Dat; and Sansevero, Frank M., 5,180,047, Cl. 198-335.000.
Nguyen, Hung P., to General Motors Corporation. Integral heater-evaporator core. 5,180,004, Cl. 165-140.000.
Nguyen, Phuong: *See*—
Yamashita, Tsutomu T.; Nguyen, Phuong; and Chen, Tu, 5,180,640, Cl. 428-611.000.
Nicholas, Allan W.: *See*—
Wall, Monroe E.; Wani, Mansukh C.; Nicholas, Allan W.; and Manikumar, Govindarajan, 5,180,722, Cl. 514-219.000.
Nicolas, Christophe; Loiseaux, Brigitte; Huignard, Jean-Pierre; and Puech, Claude, to Thomson-CSF. Device for the projection of images using two orthogonal components of light polarization. 5,181,054, Cl. 353-20.000.
Nicoletti, Bruno, to Valter, Lolli. Method to manufacture sealing nipples or pluga. 5,179,853, Cl. 72-333.000.
Niemeyer, William P., to Nasco International, Inc. Sampling bag with enclosed wire ends. 5,180,229, Cl. 383-91.000.
Niessner, Manfred; Beck, Juergen; Hartmann, Heinrich; Kemna, Andreas H.; and Wickel, Stefan, to BASF Aktiengesellschaft. Improving the water absorption capacity of crosslinked, water-swellable polymers. 5,180,804, Cl. 528-500.000.
Nihon Bunko Kogyo Kabushiki Kaisha: *See*—
Saito, Muneo; and Yamauchi, Yoshio, 5,180,487, Cl. 210-198.200.
Nihon Den-Netsu Keiki Co., Ltd.: *See*—
Kondo, Kenshi, 5,180,096, Cl. 228-180.100.
Nihon Kohden Corporation: *See*—
Harada, Hajime, 5,180,931, Cl. 307-353.000.
Nihon Shinku Gijutsu Kabushiki Kaisha: *See*—
Ishibashi, Satoru; Nakamura, Kyuzo; Higuchi, Yasushi; Komatsu, Takashi; Murata, Yuzo; and Ota, Yoshifumi, 5,180,476, Cl. 204-192.290.
Nikon Corporation: *See*—
Hara, Masaharu, 5,181,065, Cl. 354-485.000.
Sakakibara, Yasuyuki; Makinouchi, Susumu; Magome, Nobutaka; and Shiraishi, Naomasa, 5,181,067, Cl. 355-43.000.
Nilssen, Ole K. Power-factor-corrected electronic ballast. 5,180,950, Cl. 315-127.000.
Nilssen, Ole K. Electronic track lighting system. 5,180,952, Cl. 315-210.000.
Nimlok Company: *See*—
Gename, John L.; and Evensen, David P., 5,179,810, Cl. 52-240.000.
Nippon Chemiphar Co., Ltd.: *See*—
Isowa, Yoshikazu; Sato, Yoshiaki; Nakashima, Yoshiharu; Masaki, Mitsuo; Miyake, Norihisa; Uehara, Masaki; and Hirate, Kenji, 5,180,712, Cl. 514-16.000.
Okabe, Susumu; Masaki, Mitsuo; Yamakawa, Tomio; Matsukura, Hitoshi; and Nomura, Yutaka, 5,180,836, Cl. 548-302.700.
Nippon CMK Corp.: *See*—
Seki, Kameharu; Kawakami, Shin; and Kubo, Isamu, 5,180,465, Cl. 156-640.000.
Nippon Die Steel Co., Ltd.: *See*—
Takeuchi, Takayuki; and Hirata, Isao, 5,179,882, Cl. 83-125.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Yoda, Sumio; Futamura, Nobuyuki; Hashimoto, Matsuo; and Saiki, Yoshifumi, 5,180,794, Cl. 525-487.000.
Nippon Nuclear Fuel Development Co., Ltd.: *See*—
Hirai, Mutsumi; Ishimoto, Shinji; and Ito, Kenichi, 5,180,527, Cl. 252-638.000.
Nippon Oil and Fats Company, Limited: *See*—
Oshibe, Yoshihiro; Izumi, Toshihiro; Doya, Hideki; Ohmura, Hiroshi; Yamamoto, Yasuhiro; and Kumazawa, Keiji, 5,180,760, Cl. 523-169.000.
Nippon Steel Corporation: *See*—
Yamaoka, Ikuro; and Kimura, Masao, 5,180,535, Cl. 264-328.160.
Nishi, Yoshiro: *See*—
Tarumi, Yoshihiko; Takekoshi, Atuhisa; Inaba, Mamoru; Nishi, Yoshiro; Sakurai, Masaaki; Sakamoto, Satoshi; and Sato, Kimihiko, 5,180,228, Cl. 374-139.000.
Nishida, Koujiro: *See*—
Hibino, Hiromi; Hasegawa, Kazumi; Nishida, Koujiro; Abe, Kouzou; and Kurihara, Toshio, 5,180,238, Cl. 400-247.000.
Nishikaku, Fumio: *See*—
Ozato, Yukinori; Tamura, Nobuhiko; Masumori, Hiroaki; Yamamoto, Michihiro; Kojima, Atsuyuki; Nishikaku, Fumio; and Kimura, Yoshihiko, 5,180,731, Cl. 514-364.000.
Nishikawa Kaisei Co., Ltd.: *See*—
Takeuchi, Yasuo; Fujii, Mutsuo; and Soejima, Hideo, 5,180,617, Cl. 428-71.000.
Nishikawa, Kenichi: *See*—
Kurosu, Yasuo; Yokoyama, Yoshihiro; Nishikawa, Kenichi; Masuzaki, Hidefumi; and Fujinawa, Masaaki, 5,181,260, Cl. 382-46.000.
Nishikawa, Tomoyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Jam prevention mechanism. 5,181,076, Cl. 355-315.000.
Nishiki, Yoshinori; Sawamoto, Isao; Nakamatsu, Shuji; and Shimamune, Takayuki, to Permelec Electrode Ltd. Electrolytic ozonizer and method of decomposing ozone-containing waste gas using said ozonizer. 5,180,502, Cl. 210-748.000.
Nishimura, Akihiro, to Matsushita Electric Industrial Co., Ltd. Magnetic tape cassette with novel tape reel movement limiting means. 5,181,153, Cl. 360-132.000.
Nishimura, Yasushi: *See*—
Sugiyama, Ikuo; Ishibashi, Kazuhisa; Takakusaki, Nobuyuki; Maruhashi, Yoshitsugu; Nishimura, Yasushi; Koyama, Hiroshi; Iida, Setsuko; and Sato, Koji, 5,180,893, Cl. 219-10.430.
Nishino, Shigetaka: *See*—
Kato, Masayuki; Nishino, Shigetaka; Ito, Kiyotaka; and Takasugi, Hisashi, 5,180,728, Cl. 514-267.000.
Nishino, Yu: *See*—
Shigeno, Yoshiharu; Murata, Michihiro; and Nishino, Yu, 5,180,903, Cl. 235-449.000.
Nishio, Masahiro: *See*—
Sugishima, Kiyohisa; and Nishio, Masahiro, 5,181,104, Cl. 358-75.000.
Nishioka, Fumio: *See*—
Katayama, Yasuyuki; Ishimoto, Yasuhiko; Horide, Fumio; Tsuda, Shigenori; and Nishioka, Fumio, 5,180,420, Cl. 504-116.000.
Nishioka, Shoji: *See*—
Wakabayashi, Shigeru; Hirose, Shoji; Nishioka, Shoji; and Fujikawa, Yasuji, 5,180,356, Cl. 493-316.000.
Nishioka, Yoshiyuki, to Murata Kikai Kabushiki Kaisha. Yarn package supply and empty bobbin removing apparatus for warper creel. 5,180,269, Cl. 414-331.000.

Nishiwaki, Seiji; Uchida, Shinji; and Asada, Junichi, to Matsushita Electric Industrial Co., Ltd. Optical coupling apparatus for introducing and coupling an incident light into a wave guide. 5,181,265, Cl. 385-33.000.

Nishiyama, Masaaki: *See*—
Ogino, Shigeo; and Nishiyama, Masaaki, 5,181,127, Cl. 358-443.000.

Nishiyama, Seiichi: *See*—
Sakurai, Hisao; and Nishiyama, Seiichi, 5,180,989, Cl. 330-295.000.

Nishizawa, Kanji; Mitsuda, Satoshi; Komaki, Ryohei; Sugimoto, Masako; Sugiki, Chiaki; Ogami, Yasutaka; Sonoda, Kazumi; and Kishimoto, Fumitaka, to Sumitomo Chemical Company, Limited. Method for producing optically active cyclopropane carboxylic acid. 5,180,671, Cl. 435-136.000.

Nishtala, Satyanarayana: *See*—
Davidson, Howard L.; and Nishtala, Satyanarayana, 5,181,167, Cl. 361-385.000.

Nissan Motor Co., Ltd.: *See*—
Asano, Nobuhiro; and Kobayashi, Hiroshi, 5,179,861, Cl. 73-726.000.
Eto, Yoshiyuki, 5,180,024, Cl. 180-41.000.
Mori, Kazunori, 5,180,026, Cl. 180-140.000.
Terada, Masahiro; Sugimoto, Nobuji; Watanabe, Toshiro; and Sugimoto, Takashi, 5,180,629, Cl. 428-220.000.

Nisshin Flour Milling Co., Ltd.: *See*—
Matsuda, Yoshihisa; Teroaka, Reiko; Tanaka, Yukio; and Abe, Hisato, 5,180,747, Cl. 514-681.000.

Nisshinbo Industries, Inc.: *See*—
Amano, Satoshi, 5,180,631, Cl. 428-236.000.
Takaku, Akira; Hashimoto, Toshimasa; Suzuki, Toshio; Takahashi, Yutaka; and Saito, Kazuo, 5,180,529, Cl. 264-29.600.

Nissin Electric Company, Limited: *See*—
Isobe, Michiro, 5,180,918, Cl. 250-492.200.

Nissin Shokuhin Kabushiki Kaisha: *See*—
Ohno, Tsuneya, 5,180,660, Cl. 435-5.000.

NKK Corporation: *See*—
Tarumi, Yoshihiko; Takekoshi, Atuhisa; Inaba, Mamoru; Nishi, Yoshiro; Sakurai, Masaaki; Sakamoto, Satoshi; and Sato, Kimihiko, 5,180,228, Cl. 374-139.000.

Noack, Timothy J.: *See*—
Dickson, Rennie L.; Godfrey, Craig W.; Schwendemann, Kenneth L.; and Noack, Timothy J., 5,179,973, Cl. 137-433.000.

Noami, Tsuneo: *See*—
Furuya, Nobumasa; Noami, Tsuneo; and Sumikawa, Takeshi, 5,181,072, Cl. 355-225.000.

Noda, Naoyuki: *See*—
Matsumoto, Kazuhiro; Matsuo, Masayuki; and Noda, Naoyuki, 5,181,044, Cl. 343-752.000.

Noguchi, Kazuhiro; Ogino, Shigeru; and Kobayashi, Takashi, to Canon Kabushiki Kaisha. Image stabilizing apparatus. 5,181,056, Cl. 354-70.000.

Noguchi, Kunio: *See*—
Miyashita, Yukio; Ohno, Hiroshi; Noguchi, Kunio; and Fukuchi, Hironao, 5,179,929, Cl. 123-688.000.

Noguchi, Yasuo: *See*—
Idemoto, Morito; Inoue, Naohiko; and Noguchi, Yasuo, 5,180,363, Cl. 202-32.000.

Nolan, Christopher E.; Brown, Curtis M.; and DeVries, Jeffrey T., to Metal Flow Corporation. Threaded sheet metal decorative cap. 5,180,266, Cl. 411-429.000.

Nolte, David G.; Haskin, Helen K.; and Colling, Edwin L., Jr., to Texaco Inc. Means of measuring the rate and character of hydrocarbon generation from source rocks using hydrous pyrolysis. 5,180,556, Cl. 422-109.000.

Nomura Micro Science Co., Ltd.: *See*—
Kogure, Masahiko, 5,180,403, Cl. 55-53.000.

Nomura, Yoshihiro: *See*—
Era, Susumu; Matsumoto, Toshio; Kobayashi, Yoshinori; Shitara, Masashi; Hattori, Isamu; and Nomura, Yoshihiro, 5,180,786, Cl. 525-281.000.

Nomura, Yutaka: *See*—
Okabe, Susumu; Masaki, Mitsuo; Yamakawa, Tomio; Matsukura, Hitoshi; and Nomura, Yutaka, 5,180,836, Cl. 548-302.700.

Noone, Robert E.: *See*—
Sartori, Guido; Ho, W. S. Winston; and Noone, Robert E., 5,180,496, Cl. 210-654.000.

Norand Corporation: *See*—
Chadima, George E., Jr.; and Schultz, Darald R., 5,180,232, Cl. 400-88.000.

Norco Industries, Inc: *See*—
Few, Jeffrey P., 5,180,131, Cl. 248-352.000.

Norfolk Southern Railway Co.: *See*—
Kingsbury, Ronald L., 5,180,213, Cl. 303-86.000.

Norm Pacific Automation Corp.: *See*—
Shyu, Jia-Ming, 5,180,333, Cl. 454-319.000.

North Carolina State University: *See*—
Mishra, Umesh K.; and Trew, Robert J., 5,180,681, Cl. 437-40.000.

Nortrup, Kevin E., to Thomson Consumer Electronics, Inc. Self-enabling data-collision avoidance arrangement using a peak detector. 5,180,934, Cl. 307-518.000.

Norwich Eaton Pharmaceuticals, Inc.: *See*—
White, Ronald E.; and Demuth, Thomas P., Jr., 5,180,719, Cl. 514-192.000.

Nose, Tadashi, to NEC Corporation. Direct-current power source circuit with back gate control circuit for power MOS-FET. 5,180,965, Cl. 323-275.000.

Novak, Raymond F.: *See*—
States, J. Christopher; Hines, Ronald N.; and Novak, Raymond F., 5,180,666, Cl. 435-29.000.

Novick, Michael A.: *See*—
Belanger, Roger R.; Mack, Richard B.; and Novick, Michael A., 5,180,160, Cl. 271-315.000.

Nowlin, Forrest D. Device for uprooting trees. 5,180,142, Cl. 254-132.000.

Nufer, Heidi W.: *See*—
Bowman, Timothy S.; and Nufer, Heidi W., 5,180,074, Cl. 220-3.800.

Numako, Norio: *See*—
Kobayshi, Takeo; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, 5,181,060, Cl. 354-238.100.

Numao, Suteyoshi; and Miyajima, Makoto, to Murunaka & Co., Ltd.; Marunaka Kakoki Co., Ltd.; and Marunaka Tsusho Co., Ltd. Sanding method and apparatus. 5,179,805, Cl. 51-149.000.

Nussbaumer, Cornelius: *See*—
Etzweiler, Franz; Helmlinger, Daniel; Nussbaumer, Cornelius; and Pesaro, Mario, 5,180,709, Cl. 512-17.000.

Nwankwo, Donald: *See*—
Wilson, Geoffrey G.; and Nwankwo, Donald, 5,180,673, Cl. 435-199.000.

Nylund, Olov, to ABB Atom AB. Fuel assembly for nuclear reactor. 5,180,550, Cl. 376-449.000.

Ose, Yoshihisa; Sakamoto, Kiichi; and Yasuda, Hiroshi, to Fujitsu Limited. Electron beam exposure system having the capability of checking the pattern of an electron mask used for shaping an electron beam. 5,180,919, Cl. 250-492.200.

Oak Tree Packaging Corporation: *See*—
Shimizu, Jamie A., 5,180,100, Cl. 229-198.200.

Oaki, Junji; Adachi, Shuichi; Iino, Yutaka; and Shigemasa, Takashi, to Kabushiki Kaisha Toshiba. Adaptability controller for robots. 5,180,956, Cl. 318-568.110.

Ober, Jan K.: *See*—
Udden, Per; and Ober, Jan K., 5,180,907, Cl. 250-205.000.

Oberle, Joseph F., to Stryker Corporation. Pressure reduction mattress. 5,179,742, Cl. 5-464.000.

Obermayer, Arthur S.; Hendrickson, James B.; and Hussoin, Sajjat, to Moleculon Research Company. Cyclic tetrabenzimidazole. 5,180,821, Cl. 540-465.000.

O'Bryan, James E.: *See*—
Cropper, Dennis J.; O'Bryan, James E.; and Waits, Susan, 5,180,530, Cl. 264-40.500.

Occam Marine Technologies, Ltd.: *See*—
Pace, Dan R., 5,180,358, Cl. 494-48.000.

Ocean State International, Inc.: *See*—
Girvin, Robert H., 5,179,873, Cl. 74-594.100.

Oda, Kazuya, to Fuji Photo Film Co., Ltd. Image sensing apparatus. 5,181,101, Cl. 358-41.000.

Oda, Tatsuya: *See*—
Maeda, Hiroshi; Suzuki, Fujio; and Oda, Tatsuya, 5,180,582, Cl. 424-94.400.

Oehlert, Neil L. Safety container and closure system with child resistance. 5,180,072, Cl. 215-209.000.

Ogami, Yasutaka: *See*—
Nishizawa, Kanji; Mitsuda, Satoshi; Komaki, Ryohei; Sugimoto, Masako; Sugiki, Chiaki; Ogami, Yasutaka; Sonoda, Kazumi; and Kishimoto, Fumitaka, 5,180,671, Cl. 435-136.000.

Ogata, Masatsugu; Sugawara, Yasuhide; Segawa, Masanori; Abe, Hidetoshi; and Horie, Osamu, to Hitachi, Ltd. Plastic molded type electronic device. 5,181,097, Cl. 257-788.000.

Ogawa, Kazumi: *See*—
Akiyama, Takehiro; and Ogawa, Kazumi, 5,180,992, Cl. 331-11.000.

Ogawa, Makoto: *See*—
Sugie, Noboru; Furukawa, Kenichi; Ogawa, Makoto; Kurisu, Hironori; Mitsui, Tomonori; Aito, Akio; Nakamura, Mitsunori; and Mochizuki, Hiroshi, 5,181,197, Cl. 369-75.100.

Ogino, Kazuya; Akahori, Kingo; and Harada, Naoki, to Sumitomo Chemical Company, Limited. Trisazo compounds and use thereof. 5,180,817, Cl. 534-811.000.

Ogino, Shigeo; and Nishiyama, Masaaki, to Minolta Camera Kabushiki Kaisha. Image forming apparatus and method therefor. 5,181,127, Cl. 358-443.000.

Ogino, Shigeru: *See*—
Noguchi, Kazuhiro; Ogino, Shigeru; and Kobayashi, Takashi, 5,181,056, Cl. 354-70.000.

Ogiri, Tetsuo: *See*—
Narishima, Ryousuke; Ogiri, Tetsuo; Kawamura, Youji; and Iwakawa, Hiroaki, 5,180,257, Cl. 406-173.000.

Ogiso, Kenji, to Mighty Engineering Inc. Torque transmission control device. 5,180,042, Cl. 192-56.00R.

Oh, Jin: *See*—
Pearson, Scott A.; Oh, Jin; Lethin, Richard A.; and Howlett, Eric F., 5,180,132, Cl. 248-362.000.

O'Hara, Gary J.; Phillips, David B.; and Hingorani, Kishan G., to Intelligent Medical Systems, Inc. Disposable speculum with membrane bonding ring. 5,179,936, Cl. 128-9.000.

Ohaus, Karl G.: *See*—
Marsilio, Ronald M.; and Ohaus, Karl G., 5,179,740, Cl. 4-651.000.

Ohgoda, Makoto, to Fuji Photo Film Co., Ltd. Radiation image information reading apparatus. 5,180,915, Cl. 250-327.200.

Ohkuma, Saburoh. Equalizer circuit, high fidelity regenerative amplifier including equalizer circuit and acoustic characteristic correction circuit in high fidelity regenerative amplifier. 5,180,990, Cl. 330-304.000.

Ohmae, Tadayuki; Toyoshima, Yoshiki; Tanaka, Hisao; Okada, Mitsuyuki; and Fujita, Harunori, to Sumitomo Chemical Co., Ltd. Adhesive resin composition. 5,180,784, Cl. 525-207.000.

Ohmura, Hiroshi: *See*—
Oshibe, Yoshihiro; Izumi, Toshihiro; Doya, Hideki; Ohmura, Hiroshi; Yamamoto, Yasuhiro; and Kumazawa, Keiji, 5,180,760, Cl. 523-169.000.

Ohnishi, Makoto; and Shimura, Kenichi, to Terumo Kabushiki Kaisha. Hydrophilic porous material sterilizable with gamma-ray. 5,180,492, Cl. 210-490.000.

Ohno, Hiroshi: *See*—
Miyashita, Yukio; Ohno, Hiroshi; Noguchi, Kunio; and Fukuchi, Hironao, 5,179,929, Cl. 123-688.000.

Ohno, Kazunori: *See*—
Shirie, Nobuyuki; and Ohno, Kazunori, 5,181,144, Cl. 359-700.000.

Ohno, Tsuneya, to Nissin Shokuhin Kabushiki Kaisha. Methods and materials for HIV detection. 5,180,660, Cl. 435-5.000.

Ohnstein, Thomas R., to Honeywell Inc. Electronic microvalve apparatus and fabrication. 5,180,623, Cl. 428-209.000.

Ohshio, Hirohiko, to Koito Manufacturing Co., Ltd. Automotive projection type headlamp having no ultraviolet rays output. 5,180,218, Cl. 362-61.000.

Ohsora, Tetsuo: *See*—
Sato, Koji; Suzuki, Tokio; Kamiya, Hajime; Nakamura, Kimio; Kosaka, Masahisa; and Ohsora, Tetsuo, 5,181,141, Cl. 359-580.000.

Ohtani, Yuji, to Casio Computer Co., Ltd. Electronic apparatus having a calendar-display function. 5,181,273, Cl. 395-161.000.

Ohyama, Minoru; Yamazaki, Tetsuhiro; Inoue, Hiroshi; and Konno, Toshio, to Victor Company of Japan, Ltd. Optical pickup using diffracted light. 5,180,909, Cl. 250-216.000.

Oikari, Timo: *See*—
Lehtinen, Kauko; Oikari, Timo; and Yrjonen, Tapio, 5,180,916, Cl. 250-367.000.

Oka, Kazuki: *See*—
Furukawa, Shinji; Oka, Kazuki; and Tanimura, Akira, 5,181,020, Cl. 340-551.000.

Okabayashi, Makoto; Ishii, Masami; Mita, Juniti; and Shinagawa, Shigeo, to Aisin Seiki Kabushiki Kaisha. Process of joining of a galvanized steel sheet. 5,180,099, Cl. 228-263.140.

Okabe, Minoru: *See*—
Itaya, Hisao; Akebi, Kazuhiko; Okabe, Minoru; and Nakagawa, Satoru, 5,181,030, Cl. 341-20.000.

Okabe, Susumu; Masaki, Mitsuo; Yamakawa, Tomio; Matsukura, Hitoshi; and Nomura, Yutaka, to Nippon Chemiphar Co., Ltd. Imidazole derivatives. 5,180,836, Cl. 548-302.700.

Okada, Mitsuyuki: *See*—
Ohmae, Tadayuki; Toyoshima, Yoshiki; Tanaka, Hisao; Okada, Mitsuyuki; and Fujita, Harunori, 5,180,784, Cl. 525-207.000.

Okada, Ryoji; Sato, Motohiro; Yamada, Toshihiro; and Kuwabara, Heikichi, to Hitachi, Ltd. Heat transfer member. 5,180,001, Cl. 165-80.400.

Okada, Shozo: *See*—
Matsuo, Naoto; Okada, Shozo; and Inoue, Michihiro, 5,181,089, Cl. 257-299.000.

Okamoto, Mitsuo; Kodama, Hirokazu; and Minamino, Kouji, to Sharp Kabushiki Kaisha. Driving circuit for inverter microwave oven. 5,181,160, Cl. 363-97.000.

Okamura, Kazuo: *See*—
Yamaguchi, Makoto; Hake, John; Okamura, Kazuo; and Minami, Kiyoshi, 5,180,494, Cl. 210-603.000.

Okano, Masami, to Zexel Corporation. Method for checking the operability of safety system for vehicles. 5,181,011, Cl. 340-438.000.

Okanoue, Kazuhiro: *See*—
Hirose, Yutaka; Yamanaka, Yutaka; and Okanoue, Kazuhiro, 5,181,161, Cl. 369-48.000.

Okarski-Lawlor, Carol: *See*—
Okarski, Steven E.; Okarski, Scott E.; and Okarski-Lawlor, Carol, 5,179,992, Cl. 160-327.000.

Okarski, Scott E.: *See*—
Okarski, Steven E.; Okarski, Scott E.; and Okarski-Lawlor, Carol, 5,179,992, Cl. 160-327.000.

Okarski, Steven E.; Okarski, Scott E.; and Okarski-Lawlor, Carol. Self contained removable sunshade for the exterior of curb-mounted skylights. 5,179,992, Cl. 160-327.000.

Okawa, Masao: *See*—
Sukeyasu, Ryuzo; Kishina, Yoshiyuki; Okawa, Masao; Horigome, Naoyuki; and Ito, Yasuhito, 5,179,819, Cl. 53-442.000.

Okazaki, Shigeru: *See*—
Nemoto, Mitsugu; Koizumi, Noboru; and Okazaki, Shigeru, 5,181,074, Cl. 355-245.000.

Oki Electric Industry Co., Ltd.: *See*—
Kokubun, Hitoshi, 5,180,929, Cl. 307-350.000.
Takashima, Sumihiro, 5,180,991, Cl. 331-1.00A.
Yamazaki, Seiichi, 5,180,967, Cl. 323-315.000.

Okuda, Akira; and Yoshida, Yoshikazu, to Matsushita Electric Industrial Co., Ltd. Evaporation apparatus. 5,180,433, Cl. 118-718.000.

Okuda, Hajime: *See*—
Ishikawa, Masayuki; Okuda, Hajime; Shiozawa, Hideo; Itaya, Kazuhiko; Watanabe, Yukio; Suzuki, Mariko; and Hatakoshi, Genichi, 5,181,218, Cl. 372-45.000.

Okuhira, Hidekazu: *See*—
Usagawa, Toshiyuki; Imamura, Yoshinori; Okuhira, Hidekazu; Goto, Shigeo; Kobayashi, Masayoshi; and Takatani, Shinichiro, 5,181,087, Cl. 257-194.000.

Oleksinski, John A.; and Hedberg, Earl D., to Station Eight, Inc. Method and apparatus for rewiring corona wire cartridge. 5,181,069, Cl. 355-133.000.

O'Lenick, Anthony J., Jr. Terminal substituted silicone fatty esters. 5,180,843, Cl. 556-77.000.

Olshaker, Robert: *See*—
Fishman, Henry; Olshaker, Robert; and Johnson, Gary, 5,179,959, Cl. 128-743.000.

Olympus Optical Co., Ltd.: *See*—
Matsueda, Akira, 5,181,196, Cl. 369-48.000.
Miyagi, Takayasu, 5,179,935, Cl. 128-4.000.
Nagayoshi, Mitsugu; Miyazaki, Atsushi; Miyanaga, Hirofumi; Takehana, Sakae; Adachi, Hideyuki; Ueda, Yasuhiro; Fuse, Eiichi; and Aoki, Yoshisada, 5,179,934, Cl. 128-4.000.

Omid, Ahmad, to Chevron Chemical Company. Preemergence weed control in selected crops. 5,180,415, Cl. 504-299.000.

Omori, Takashi: *See*—
Kojima, Yutaka; and Omori, Takashi, 5,180,624, Cl. 428-211.000.

One-half to Hans Stahlecker: *See*—
Stahlecker, Fritz, 5,179,828, Cl. 57-269.000.

Ono, Katsuhiro; Anno, Hidero; Sugiura, Hiroyuki; and Kitami, Takayuki, to Kabushiki Kaisha Toshiba. Rotary-anode type X-ray tube. 5,181,235, Cl. 378-133.000.

Onoda Cement Co. Ltd.: *See*—
Narishima, Ryousuke; Ogiri, Tetsuo; Kawamura, Youji; and Iwakawa, Hiroaki, 5,180,257, Cl. 406-173.000.

Ooishi, Toshimitsu, to Konami Kogyo Kabushiki Kaisha. Display device for displaying a wide picture. 5,181,122, Cl. 358-238.000.

Oppama Kogyo Kabushiki Kaisha: *See*—
Take, Shigeo, 5,181,232, Cl. 377-30.000.

Opsal, Jon: *See*—
Fanton, Jeffrey T.; Opsal, Jon; and Rosencwaig, Allan, 5,181,080, Cl. 356-381.000.

O'Reilly, David R.: *See*—
Miller, Lois K.; and O'Reilly, David R., 5,180,581, Cl. 424-93.00A.

Orime, Nobutake: *See*—
Inoue, Masato; Tajima, Minoru; Orime, Nobutake; and Katagi, Takashi, 5,181,040, Cl. 342-149.000.

Orimoto, Masaaki; Harase, Toshikatsu; and Mizuno, Masahiko, to Fuji Photo Film Co., Ltd. System for unloading a memory cartridge. 5,179,871, Cl. 74-516.000.

Orminski, John K., to General Motors of Canada Limited. Hot restart compensation. 5,179,925, Cl. 123-491.000.

Orscheln Co.: *See*—
Arnold, James H.; Perisho, Randal J.; DeWitt, Michael D.; and Soucie, Wayne L., 5,180,038, Cl. 188-171.000.

Orth, Erich: *See*—
Bogotzek, Hans; Mairose, Hans-Peter; and Orth, Erich, 5,179,775, Cl. 29-564.400.

Orth, Heinz-Dietmar, to Hoesch Maschinenfabrik Deutschland AG. Machinery for welding helical-seam pipe from metal strip. 5,180,095, Cl. 228-17.700.

Osaka, Takahide: *See*—
Choshitani, Hitoshi; Osaka, Takahide; Itojima, Fumiaki; and Yasuda, Masashi, 5,180,958, Cl. 318-623.000.

Oscar Mayer Foods Corporation: *See*—
Feldmeier, Daniel R.; and McCann, Michael, 5,180,599, Cl. 426-106.000.

Oshibe, Yoshihiro; Izumi, Toshihiro; Doya, Hideki; Ohmura, Hiroshi; Yamamoto, Yasuhiro; and Kumazawa, Keiji, to Nippon Oil and Fats Company, Limited. Anti-fogging resin film-forming composition. 5,180,760, Cl. 523-169.000.

Osipow, Lloyd I.; Marra, Dorothea C.; and Spitzer, J. George. Process for the manufacture of synthetic polymer propellant systems. 5,180,753, Cl. 521-65.000.

Osti, Roberto; and Minarelli, Alessandro, to GD. S.p.A. Controlled heat seal device for fastening wrappers of thermoplastic material, in particular in machines for overwrapping packets of cigarettes and the like. 5,179,814, Cl. 53-75.000.

Ostrowski, Clarence. Drapery installation tool. 5,179,787, Cl. 33-613.000.

Oswal, Ravinder K.: *See*—
Shafe, Jeff; Straley, O. James; McCarty, Gordon; Oswal, Ravinder K.; and Dharia, Amitkumar N., 5,181,006, Cl. 338-22.00R.

Oswald, Gordon K. A.; Neal, Christopher S.; and Richardson, Alan T., to Cambridge Consultants Limited. System for sensing the approach of a moving missile to a target. 5,181,039, Cl. 342-119.000.

Oswald, William A.: *See*—
Melber, George E.; Wolinski, Leon E.; and Oswald, William A., 5,180,752, Cl. 521-57.000.

Ota, Hideo, to Makita Corporation. Nailing machine. 5,180,091, Cl. 227-8.000.

Ota, Yoshifumi: *See*—
Ishibashi, Satoru; Nakamura, Kyuzo; Higuchi, Yasushi; Komatsu, Takashi; Murata, Yuzo; and Ota, Yoshifumi, 5,180,476, Cl. 204-192.290.

Otis Elevator Company: *See*—
Barrett, Dale R.; Nguyen, Dat; and Sansevero, Frank M., 5,180,047, Cl. 198-335.000.

Otis Engineering Corporation: *See*—
Cox, Don C., 5,180,014, Cl. 166-384.000.
Dickson, Rennie L.; Godfrey, Craig W.; Schwendemann, Kenneth L.; and Noack, Timothy J., 5,179,973, Cl. 137-433.000.
Ross, Colby M.; and Restarick, Henry I., 5,180,016, Cl. 166-387.000.

Otterbach, Rainer: *See*—
Steiner, Gerd; Weniger, Rudi; Braun, Rolf; Otterbach, Rainer; Schubert, Erhard; and Hofmann, Ralf, 5,181,257, Cl. 382-17.000.
Outboard Marine Corporation: *See*—
Calamia, David C.; Binversie, Gregory J.; and Petersen, H. Norman, 5,180,320, Cl. 440-61.000.
Lieb, Matthew J., 5,180,925, Cl. 307-114.000.
Ovshinsky, Stanford R.: *See*—
Czubatyj, Wolodymyr; Ovshinsky, Stanford R.; Wicker, Guy C.; Beglau, David; Himmler, Ronald; Jablonski, David; and Guha, Subhendu, 5,180,690, Cl. 437-233.000.
Owenby, Daniel B.; and Quesinberry, Gene, to Beacon Manufacturing Company. Printed woven blanket. 5,180,401, Cl. 8-478.000.
Oyabu, Kenzo: *See*—
Nakamura, Yoshizo; Oyabu, Kenzo; and Tomozawa, Nakanori, 5,179,795, Cl. 38-143.000.
Ozaki, Hiroji: *See*—
Eimori, Takahisa; Wakamiya, Wataru; Ozaki, Hiroji; Tanaka, Yoshinori; and Satoh, Shinichi, 5,181,094, Cl. 257-372.000.
Wakamiya, Wataru; Tanaka, Yoshinori; Eimori, Takahisa; Ozaki, Hiroji; Kimura, Hiroshi; and Satoh, Shinichi, 5,180,683, Cl. 437-47.000.
Ozari, Yehuda: *See*—
Plamthottam, Sebastian S.; and Ozari, Yehuda, 5,180,635, Cl. 428-345.000.
Ozato, Yukinori; Tamura, Nobuhiko; Masumori, Hiroaki; Yamamoto, Michihiro; Kojima, Atsuyuki; Nishikaku, Fumio; and Kimura, Yoshihiko, to Sumitomo Pharmaceuticals Company, Limited. Aminoazole derivatives and their production and use. 5,180,731, Cl. 514-364.000.
Ozawa, Hitoshi: *See*—
Nakamura, Morio; Yamamoto, Takushi; Tanaka, Hitoshi; Ozawa, Hitoshi; and Shimada, Yasuhiro, 5,180,798, Cl. 526-66.000.
Ozawa, Kiyosho: *See*—
Nakatani, Isao; Ozawa, Kiyosho; Hijikata, Masayuki; and Takahashi, Tsutomu, 5,180,512, Cl. 252-62.510.
Ozawa, Yoshio; Matsumoto, Takashi; and Saito, Kimitoshi, to Fuji Photo Film Co., Ltd. Paper device and method for photographic printer. 5,181,066, Cl. 355-29.000.
Ozu, Takahiro: *See*—
Hayama, Kazuhide; Hata, Kazuyuki; Yamada, Katsuhiko; Abe, Keizo; and Ozu, Takahiro, 5,180,766, Cl. 524-315.000.
Pace, Dan R., to Occam Marine Technologies, Ltd. Adjustment mechanism for low speed particle concentrator. 5,180,358, Cl. 494-48.000.
Pace Incorporated: *See*—
Siegel, William J.; Abbagnaro, Louis A.; and Kantter, William J., 5,180,440, Cl. 136-230.000.
Pace, Sang H. Variable mulching mower with edger attachment. 5,179,823, Cl. 56-16.900.
Paciello, Rocco A., to Du Pont de Nemours, E. I., and Company. Hydrogenation of polyenes. 5,180,870, Cl. 585-277.000.
Packard, Brian M.: *See*—
Dutcher, Robert G.; Packard, Brian M.; and Scott, Robert J., 5,179,962, Cl. 128-785.000.
Padwa, Allen R.; Lavengood, Richard E.; and Patel, Raman, to Monsanto Company. Rubber-modified nylon composition. 5,180,777, Cl. 525-66.000.
Paetzold, Frank: *See*—
Grecksch, Hans; and Paetzold, Frank, 5,179,829, Cl. 57-281.000.
Pagendarm GmbH: *See*—
Hebels, Albert, 5,179,908, Cl. 118-68.000.
Pallari, Olli. Lifting and crushing apparatus for tree stumps. 5,179,985, Cl. 144-359.000.
Palmer, John W.: *See*—
Medamana, John B.; Palmer, John W.; and Weber, Roy P., 5,181,238, Cl. 379-95.000.
Panametrics, Inc.: *See*—
Lynnworth, Lawrence C., 5,179,862, Cl. 73-861.280.
Pancheri, Eugene J.: *See*—
Boucher, Jeffrey E.; and Pancheri, Eugene J., 5,180,515, Cl. 252-135.000.
Panzera, Carlino: *See*—
Prasad, Arun; and Panzera, Carlino, 5,180,427, Cl. 106-35.000.
Panzica, Patricia S.; and Goodrell, Guy I. Game projectile. 5,180,171, Cl. 273-428.000.
Paratte, Daniel; and Aeschbacher, Jean-Pascal, to ETA SA Fabriques d'Ebauches. Housing for an energy cell in a wristwatch. 5,181,192, Cl. 368-282.000.
Paratte, Lionel; Bornand, Etienne; and Racine, Georges-Andre , to Asulab S.A. Radial field electrostatic micromotor produced using a photolithographic micromanufacturing technique and a process for producing said micromotor. 5,180,940, Cl. 310-40.0MM.
Parikh, Harsh B.; and Crosby, Robert M., to Texas Instruments, Incorporated. Non-volatile counting method and apparatus. 5,181,231, Cl. 377-26.000.
Park, John J.; Katz, Leon; and Gaylord, Norman G., to James River Corporation of Virginia. Polypropylene foam sheets. 5,180,751, Cl. 521-51.000.
Park, Jong-Ho: *See*—
Ko, Kwang-Ok; and Park, Jong-Ho, 5,180,468, Cl. 156-644.000.
Parks, D. Elliot: *See*—
Dillner, Joakim; Lerner, Richard A.; Smith, Richard; and Parks, D. Elliot, 5,180,806, Cl. 530-326.000.
Parsons, C. Lowell, to University of California, The Regents of the. Irrigation of internal bladder surfaces in mammals with sodium pentosanpolysulfate. 5,180,715, Cl. 514-54.000.
Pascor, Michel, to Equipments Speciaux Pour l'Aviation (ESPA). Articulated clamp for fastening pipes. 5,180,124, Cl. 248-74.400.
Pastor, Manuel: *See*—
McCarthy, Donald J., deceased; and Pastor, Manuel, 5,180,230, Cl. 384-54.000.
Patchett, Jeffrey J.: *See*—
Cahill, Michael J.; Patchett, Jeffrey J.; Seaward, David R.; Shirley, Graham L.; and Vernon, Geoffrey W., 5,179,815, Cl. 53-133.300.
Patel, Raman: *See*—
Padwa, Allen R.; Lavengood, Richard E.; and Patel, Raman, 5,180,777, Cl. 525-66.000.
Patent Treuhand Gesellschaft fur Elektrische Gluhlampen m.b.H.: *See*—
Weiss, Werner; Mair, Manfred; Deisenhofer, Manfred; and Poesl, Ewald, 5,180,695, Cl. 501-66.000.
Patterson, Maureen: *See*—
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Patton, Lloyd L., Sr.: *See*—
Anderson, Robert M.; Vining, John E., Sr.; and Patton, Lloyd L., Sr., 5,180,437, Cl. 134-10.000.
Patton, Tad L.: *See*—
Austin, Richard G.; and Patton, Tad L., 5,180,797, Cl. 525-539.000.
Paul, Darrell D.: *See*—
Hsieh, Paonan; McComis, William T.; Senapati, Nagabhusan; Stulen, Foster B.; and Paul, Darrell D., 5,180,600, Cl. 426-233.000.
Paul, Joseph: *See*—
Mackay, Donald; Paul, Joseph; and Goble, Greg, 5,181,049, Cl. 316-140.00R.
Paul, Marlene: *See*—
Berube, Martin; Bilodeau, Julien; Paul, Marlene; Gaucher, Ronald; Cote, Germain; and Boudreault, Guy, 5,179,982, Cl. 141-20.000.
Paul, Richard W.: *See*—
Koul, Maharaj K.; Whitaker, Franklin T.; and Paul, Richard W., 5,179,997, Cl. 164-473.000.
Paurat, Friedrich W.; and Paurat, Roland. Underground protection underneath a dump. 5,180,251, Cl. 405-129.000.
Paurat, Roland: *See*—
Paurat, Friedrich W.; and Paurat, Roland, 5,180,251, Cl. 405-129.000.
Pawletko, Joseph P.: *See*—
Karidis, John P.; McVicker, Gerard; and Pawletko, Joseph P., 5,180,955, Cl. 318-568.100.
Payne, Steven R.: *See*—
Cordner, Edward T., Jr.; Payne, Steven R.; and Istratoff, Glenn J., 5,179,983, Cl. 141-27.000.
Payr, Hans. Apparatus for dividing wood. 5,179,883, Cl. 83-155.100.
Peana, Daniel: *See*—
Marozsan, Andrew; and Peana, Daniel, 5,180,248, Cl. 403-13.000.
Pearce, Ronald A.; and Hooker, Ira D., Jr., to Rapsco Incorporated. Can end handling system. 5,180,277, Cl. 414-792.700.
Pearman, James B.: *See*—
Richards, John W.; Pearman, James B.; and Hurley, Terry R., 5,181,114, Cl. 358-146.000.
Pearson, Scott A.; Oh, Jin; Lethin, Richard A.; and Howlett, Eric F. Self-setting suction holder device. 5,180,132, Cl. 248-362.000.
Peery, John R.: *See*—
Magruder, Judy A.; Peery, John R.; and Eckenhoff, James B., 5,180,591, Cl. 424-473.000.
Pees, James M.: *See*—
Hellyer, Richard A.; Wagner, James R.; Pees, James M.; and Lohmann, Detlef, 5,180,144, Cl. 267-64.190.
Pelosi, Michael H., III: *See*—
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Pendergrass, Paul J.; and Allcock, Edmund, to Independent Cable, Inc. Communications transmission cable. 5,180,890, Cl. 174-117.00F.
Penn, Aubery W.: *See*—
Kouzel, Richard L.; Penn, Aubery W.; Jensen, Brian D.; and Dicke, Paul A., 5,180,003, Cl. 165-121.000.
Pennella, Filippo; Lin, Fan-Nan; and Johnson, Marvin M., to Phillips Petroleum Company. Separation of indole from hydrocarbons. 5,180,485, Cl. 208-254.00R.
Pennzoil Products Company: *See*—
Heilman, William J.; and Venier, Clifford G., 5,180,865, Cl. 585-10.000.
Pepin, Regis: *See*—
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Pepperl, Rudiger: *See*—
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Perfectionist Audio Components Inc.: *See*—
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Perisho, Randal J.: *See*—
Arnold, James H.; Perisho, Randal J.; DeWitt, Michael D.; and Soucie, Wayne L., 5,180,038, Cl. 188-171.000.
Permelec Electrode Ltd.: *See*—
Nishiki, Yoshinori; Sawamoto, Isao; Nakamatsu, Shuji; and Shimamune, Takayuki, 5,180,502, Cl. 210-748.000.
Pernice, Robert J., to Pernice, Robert J.; and Pernice, Sophia C., a part interest. Magneto rotor. 5,179,872, Cl. 74-572.000.
Pernice, Sophia C.: *See*—
Pernice, Robert J., 5,179,872, Cl. 74-572.000.
Perona, Ronald J. Timing and scorekeeping ring. 5,181,009, Cl. 340-407.000.

Perren, Stephan: *See*—
Frigg, Robert; Perren, Stephan; Allgower, Martin; and Gisin, Paul, 5,180,382, Cl. 606-65.000.

Perrenoud, Stephen A., Jr. Tractor implement orientation system. 5,180,028, Cl. 180-235.000.

Perry, Robert A. No reduction using sublimation of cyanuric acid. 5,180,565, Cl. 423-235.000.

Pesaro, Mario: *See*—
Etzweiler, Franz; Helmlinger, Daniel; Nussbaumer, Cornelius; and Pesaro, Mario, 5,180,709, Cl. 512-17.000.

Pesold, Erwin: *See*—
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Petersen, H. Norman: *See*—
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Peterson, David M.: *See*—
Cornwall, Mickey; Peterson, David M.; and Stern, Theodore G., 5,180,441, Cl. 136-246.000.

Peterson, David T. Method and apparatus for free-standing water removal from roof and siphon head therefor. 5,179,969, Cl. 137-1.000.

Peterson, Ronald R.: *See*—
Abatjoglou, Anthony G.; Bryant, David R.; and Peterson, Ronald R., 5,180,854, Cl. 568-454.000.

Peterson, William A.; Elmore, Michael S.; and Sherwood, Steven D., to General Electric Company. AC to DC converter having an enhanced power factor. 5,181,159, Cl. 363-89.000.

Petisce, James R., to AT&T Bell Laboratories. Optical fiber including acidic coating system. 5,181,269, Cl. 385-128.000.

Petlevich, Walter J., Jr.: *See*—
Schweizer, Philipp F.; and Petlevich, Walter J., Jr., 5,181,254, Cl. 382-1.000.

Petrelli, Robert: *See*—
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Petroff, Larry J.; and Miller, James H., to Chevron Research and Technology Company. Joint locking system for pipe. 5,180,195, Cl. 285-231.000.

Pettijohn, Ted M., to Phillips Petroleum Company. Metal halide catalyst, method of producing the catalyst, polymerization process employing the catalyst, and polymer produced by the polymerization process. 5,180,702, Cl. 502-107.000.

Pews, R. Garth: *See*—
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Pezzani, Robert, to SGS-Thomson Microelectronics S.A. PIN diode with a low peak-on effect. 5,181,083, Cl. 257-491.000.

Pezzuti, John F.: *See*—
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Pfeiffer, Martin: *See*—
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Pfitzinger, Walter R.: *See*—
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Pham, Xuan M.: *See*—
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Philip Morris Incorporated: *See*—
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Barnes, John D.; Fishburne, Howard H.; Pham, Xuan M.; and Pitt, Linwood L., Jr., 5,179,817, Cl. 53-148.000.
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Losee, D. Bruce; Morgan, Constance H.; Sprinkel, F. Murphy; and Utsch, Francis V., 5,179,966, Cl. 131-351.000.

Philliber, Robert A.: *See*—
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Phillips, David B.: *See*—
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Phillips, Douglas B., Sr. Chamfering reamer with trip shoulder. 5,180,260, Cl. 408-211.000.

Phillips Petroleum Company: *See*—
Pennella, Filippo; Lin, Fan-Nan; and Johnson, Marvin M., 5,180,485, Cl. 208-254.00R.
Pettijohn, Ted M., 5,180,702, Cl. 502-107.000.
Shaw, James E., 5,180,852, Cl. 568-57.000.
Sutherlin, Dirk M., 5,180,796, Cl. 525-537.000.
Wu, An-hsiang, 5,180,848, Cl. 562-405.000.

Phillips, Thomas R.; Dewolf, Thomas L.; and Bench, Ronald W., to Carrier Corporation. Heat reclamation from and adjustment of defrost cycle. 5,179,841, Cl. 62-81.000.

Philogene, Bernard J. R.: *See*—
Morand, Peter; Arnason, John T.; Philogene, Bernard J. R.; MacEachern, Anita M.; Leitch, Leonard C.; and Kaminski, Jerzy, 5,180,838, Cl. 549-59.000.

Phosphate Engineering and Construction Company: *See*—
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Photonetics S.A.: *See*—
Lefevre, Herve ; and Martin, Philippe, 5,181,078, Cl. 356-350.000.

Picard, Jean-Paul. Vertical lift system through tangential blowing of air jets channelled over the top of rotating cylinders. 5,180,119, Cl. 244-10.000.

Piccolo, Joseph R., Sr.; Swilling, William H., Jr.; Kearney, Michael R.; and Mosher, Douglas E., to Farrel Corporation. Rotor zone cooling apparatus for rotors in continuous mixers of plastic materials. 5,180,225, Cl. 366-147.000.

Pichot, Patrice J.: *See*—
Simon, Georges H.; Pichot, Patrice J.; and Boissau, Alain J. M., 5,180,879, Cl. 89-33.170.

Piejko, Karl-Erwin: *See*—
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Pierce & Stevens Corporation: *See*—
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Piereth, Richard J.: *See*—
Dowden, Douglas C.; Hemmeter, Richard W.; Herr, Diane E.; McCormick, William K.; Petrelli, Robert; Piereth, Richard J.; Salchenberger, Samuel M.; Sehgal, Chander S.; and Verma, Mahendra K., 5,181,237, Cl. 379-88.000.

Pinkerton, Steven J.; and Menard, Alan, to Emhart Glass Machinery Investments Inc. Shear mechanism for glassware forming machine. 5,180,413, Cl. 65-334.000.

Pinschmidt, Robert K., Jr.: *See*—
Listemann, Mark L.; and Pinschmidt, Robert K., Jr., 5,180,851, Cl. 564-134.000.

Pinto, Albert A. Riding toy mechanism. 5,180,338, Cl. 472-96.000.

Pioneer Consolidated Corporation: *See*—
Haddad, Edward N., Jr., 5,179,991, Cl. 160-310.000.

Pioneer Electronic Corp.: *See*—
Aoyama: Tatsuya, 5,181,103, Cl. 358-64.000.
Shinokura, Kiichiro; and Kawaguchi, Hitoshi, 5,181,213, Cl. 372-30.000.

Pissiotas, Georg; Moser, Hans; Brunner, Hans-Georg; and Steiner, Eginhard, to Ciba-Geigy Corporation. Herbicidally active thiadiazabicyclononanes and nonenes. 5,180,418, Cl. 504-193.000.

Pitney Bowes Inc.: *See*—
Branecky, George N.; and Pezzuti, John F., 5,180,151, Cl. 270-45.000.
Helit, Thomas M.; Lowell, Kenneth W.; and Synnett, Karen P., 5,180,157, Cl. 271-256.000.
Malick, Shahzad H., 5,180,154, Cl. 271-2.000.
Malick, Shahzad H., 5,180,159, Cl. 271-302.000.
Marzullo, Joseph H., 5,180,357, Cl. 493-420.000.

Pitney Bowes plc.: *See*—
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Pitt, Linwood L., Jr.: *See*—
Barnes, John D.; Fishburne, Howard H.; Pham, Xuan M.; and Pitt, Linwood L., Jr., 5,179,817, Cl. 53-148.000.

PLAKOMA Planungen und Konstruktionen von maschinellen Einrichtungen GmbH: *See*—
Braun, E.; and Wojciechowski, Jurgen, 5,179,772, Cl. 29-81.050.

Plamthottam, Sebastian S.; and Ozari, Yehuda, to Avery Dennison Corporation. High performance pressure sensitive adhesive tapes. 5,180,635, Cl. 428-345.000.

Plecha, Stanislaw: *See*—
Ziebarth, Michael S.; Hager, Michael J.; Beeckman, Jean W.; and Plecha, Stanislaw, 5,180,703, Cl. 502-243.000.

Plotts, Alan E.: *See*—
Gerace, Jeffrey T.; Plotts, Alan E.; and Abendschein, Frederic H., 5,181,267, Cl. 385-86.000.

Plummer, Mark A., to Marathon Oil Company. Conversion of hydrogen sulfide to sulfur and hydrogen. 5,180,572, Cl. 423-576.700.

Pochopien, Kevin P.: *See*—
Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; White, Danny R.; Johnson, William B.; and Aghajanian, Michael K., 5,180,697, Cl. 501-96.000.

Poesl, Ewald: *See*—
Weiss, Werner; Mair, Manfred; Deisenhofer, Manfred; and Poesl, Ewald, 5,180,695, Cl. 501-66.000.

Poetsch, Eike: *See*—
Eidenschink, Rudolf; Hopf, Reinhard; and Poetsch, Eike, 5,180,521, Cl. 252-299.610.

Poisson, Claude: *See*—
Carlier, Patrick; Combourieu, Michel; Poisson, Claude; and Monteil, Andre J., 5,180,726, Cl. 514-252.000.

Polaroid Corporation: *See*—
Mauchan, Donald E., 5,181,059, Cl. 354-108.000.

Polasky, Ralph A., to Ametek, Inc. Apparatus for removal of iron from drinking water. 5,180,491, Cl. 210-282.000.

Polefka, Thomas G.; Sanai, Deborah S.; and Jannone, Brian S., to Colgate-Palmolive. Stabilized bis biguanide/anionic active ingredient compositions. 5,180,577, Cl. 424-52.000.

Poletto, Vanni, to SGS-Thomson Microelectronics S.r.l. Reset device for microprocessor, particularly for automotive applications. 5,180,927, Cl. 307-272.300.

Poll, Gerhard: *See*—
Blond, Alejandro; Poll, Gerhard; and Tadic, Vedran, 5,180,980, Cl. 324-229.000.

Poly-Flex Circuits, Inc.: *See*—
Durand, David; Viesu, David P.; Chu, Ang-Ling; and Weiu, Tai S., 5,180,523, Cl. 252-512.000.

Polyclinique de Bourgogne & Les Hortensiad: *See*—
Commarmond, Jacques, 5,180,393, Cl. 623-13.000.
Ponder, Wade H.: *See*—
McCrillis, Robert C.; Butts, Nelson L.; Ponder, Wade H.; and Abbott, James H., 5,179,933, Cl. 126-77.000.
Poole, Warren D.: *See*—
Ngo, Viet H.; Poole, Warren D.; Hancock, Sean J.; and France, Timothy T., 5,180,501, Cl. 210-747.000.
Porta, Earnest W.: *See*—
Anton, David L.; DiCosimo, Robert; and Porta, Earnest W., 5,180,846, Cl. 562-17.000.
Porteous, Paul. Safety needle containment. 5,180,374, Cl. 604-192.000.
Porter, Carl W.: *See*—
Sufrin, Janice R.; Bacchi, Cyrus J.; Porter, Carl W.; Nathan, Henry; Spiess, Arthur J.; and Yarlett, Nigel, 5,180,714, Cl. 514-46.000.
Possis Medical, Inc.: *See*—
Dutcher, Robert G.; Packard, Brian M.; and Scott, Robert J., 5,179,962, Cl. 128-785.000.
Postma, Stephen J.; Gesin, Milford M.; Demma, Nick A.; Bjork, Paul E.; and Wagener, Thomas J., to Honeywell Inc. Proximity sensor with reduced temperature sensitivity using A.C. and D.C. energy. 5,180,978, Cl. 324-207.160.
Poulos, Steven L. Hot air boot dryer. 5,179,790, Cl. 34-104.000.
Powers, James C.; May, Sheldon W.; Hernandez, Maria A.; Thornton, Steve; and Glinski, Jan, to Georgia Tech Research Corporation. Quaternary pyridinium compounds. 5,180,831, Cl. 546-291.000.
Prader, Peter E.: *See*—
Beuving, Lauren J.; and Prader, Peter E., 5,179,986, Cl. 144-362.000.
Prasad, Arun; and Panzera, Carlino, to Jeneric/Pentron, Inc. Fillers for investment and refractory die materials. 5,180,427, Cl. 106-35.000.
Presidenza Del Consiglio Dei Ministri: *See*—
Lepori, Agostino; Zavatteri, Ignazio; and Cova, Mario, 5,180,770, Cl. 524-563.000.
Press-Seal Gasket Corporation: *See*—
Skinner, James W., 5,180,196, Cl. 285-253.000.
Previdoli, Felix: *See*—
Griffiths, Gareth; Warm, Aleksander; Previdoli, Felix; and Ryan, Gary, 5,180,826, Cl. 544-332.000.
Pridemore, Donald F.: *See*—
Strobel, Donald H.; Pridemore, Donald F.; and Gomez, Greg M, 5,181,241, Cl. 379-107.000.
Priestley, Joseph B., Jr. Filtration system with apparatus for altering magnetic properties of particles. 5,180,557, Cl. 422-139.000.
Prince Corporation: *See*—
Suman, Michael J.; Reed, Stewart D.; Frye, Dale J.; and Clark, Russell L., 5,180,089, Cl. 224-42.45R.
Pro Eton Corporation: *See*—
Hu, James, 5,180,058, Cl. 206-309.000.
Procter, David F.: *See*—
Daw, Terry L.; Procter, David F.; and Moss, Kevin D., 5,180,331, Cl. 454-187.000.
Procter & Gamble Company, The: *See*—
Berg, Charles J.; Roe, Donald C.; and Lahrman, Frank H., 5,180,622, Cl. 428-192.000.
Boucher, Jeffrey E.; and Pancheri, Eugene J., 5,180,515, Cl. 252-135.000.
Thomas, Dennis A.; Goulait, David J. K.; and Cox, Robert G., Jr., 5,180,534, Cl. 264-145.000.
Progressive Technologies, Inc.: *See*—
Hundt, Gary, 5,180,076, Cl. 220-420.000.
Proprietary Technology, Inc.: *See*—
Bartholomew, Donald D., 5,179,922, Cl. 123-198.0DB.
Province, Clarence T. Potter's wheelhead assembly with relocatable axis of rotation. 5,180,174, Cl. 279-6.000.
Proxima Corporation: *See*—
Marshall, Roger N.; Hauck, Lane T.; Shapiro, Leonid; Busch, Jeffrey W.; and Stevens, Eric S., 5,181,015, Cl. 340-706.000.
Prusak, Joseph P.; and Bassaro, Anthony, to Hughes Danbury Optical Systems, Inc. Apparatus for providing consistent registration of semiconductor wafers. 5,180,150, Cl. 269-254.00R.
Puech, Claude: *See*—
Nicolas, Christophe; Loiseaux, Brigitte; Huignard, Jean-Pierre; and Puech, Claude, 5,181,054, Cl. 353-20.000.
Purdy, David E., to Siemens Medical Systems, Inc. Method for 3-D magnetic resonance imaging. 5,180,981, Cl. 324-309.000.
Pursley, John A.; Holloway, Jordan M.; and Wakefield, Thomas L., to Autogenesis Corporation. Automatic compression-distraction-torsion method and apparatus. 5,180,380, Cl. 606-54.000.
Quartz et Silice: *See*—
Le Moigne, Jacques; Thierry, Annette; and Guerder, Pierre, 5,180,463, Cl. 156-603.000.
Quates, Ronald D.: *See*—
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Quesinberry, Gene: *See*—
Owenby, Daniel B.; and Quesinberry, Gene, 5,180,401, Cl. 8-478.000.
Quick, James R.; Alexander, James L.; Lai, Christopher C.; Matthews, Susan A.; and Wenzel, Donna J., to International Paper Company. Tube from microwave susceptor package. 5,180,894, Cl. 219-10.55E.
R. Schmidt GmbH: *See*—
Schmidt, Reinhard, 5,180,207, Cl. 297-408.000.
Racine, Georges-Andre : *See*—
Paratte, Lionel; Bornand, Etienne; and Racine, Georges-Andre , 5,180,940, Cl. 310-40.0MM.
Rada, Mark Z.; Willis, John W.; Eade, John A.; and Kidwell, Charles E., to Delco Electronics Corporation. Pushbutton rotary switch. 5,180,050, Cl. 200-329.000.
Raeymaekers, Alfons H. M.: *See*—
Freyne, Eddy J. E.; Raeymaekers, Alfons H. M.; Sipido, Victor; and Venet, Marc G., 5,180,832, Cl. 546-333.000.
Rahnenfuhrer, Eckhard: *See*—
Jaskolka, Heinz; Rahnenfuhrer, Eckhard; and Schulze, Albert, 5,180,883, Cl. 102-443.000.
Raman, Krishna: *See*—
Cookson, Gleason O.; Dang, Vu A.; and Raman, Krishna, 5,180,830, Cl. 546-222.000.
Rao, Banagaru V. N., to Ferrous Wheel Group Inc. High performance high strength low alloy wrought steel. 5,180,450, Cl. 148-579.000.
Rapsco Incorporated: *See*—
Pearce, Ronald A.; and Hooker, Ira D., Jr., 5,180,277, Cl. 414-792.700.
Raque Food Systems, Inc.: *See*—
McLeod, Jesse C., 5,179,885, Cl. 83-315.000.
Rastergraphics, Inc.: *See*—
Bibl, Andreas; and Fellingham, George H., 5,181,050, Cl. 346-155.000.
Rathje, Marvin E., Jr. Radial beam arm saw table. 5,179,886, Cl. 83-471.300.
Rauschenbach, Reinhard, to Alfred Teves GmbH. Method for setting the desired closure travel of a hydraulic cylinder control valve. 5,179,834, Cl. 60-327.000.
Ravet, Georges: *See*—
Rousset, Jacky; and Ravet, Georges, 5,180,790, Cl. 525-329.600.
Ravichandran, Ramanathan: *See*—
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Ray, Lawrence D.: *See*—
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Raychem Corporation: *See*—
Shafe, Jeff; Straley, O. James; McCarty, Gordon; Oswal, Ravinder K.; and Dharia, Amitkumar N., 5,181,006, Cl. 338-22.00R.
Raycon Corporation: *See*—
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Raymond Corporation: *See*—
Avitan, Isaac, 5,181,173, Cl. 364-424.050.
Raytheon Company: *See*—
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Reckers, Janet A.: *See*—
Smith, Raymond D.; and Reckers, Janet A., 5,180,052, Cl. 206-45.110.
Reed, Michael A. Pulley guard apparatus. 5,180,343, Cl. 474-144.000.
Reed, Stewart D.: *See*—
Suman, Michael J.; Reed, Stewart D.; Frye, Dale J.; and Clark, Russell L., 5,180,089, Cl. 224-42.45R.
Regelsberger, Matthias H.: *See*—
Lee, J. Kelly; Reznik, Svetlana; and Regelsberger, Matthias H., 5,181,021, Cl. 340-572.000.
Rehmer, Gerd; and Boettcher, Andreas, to BASF Aktiengesellschaft. Agents curable by ultraviolet radiation. 5,180,756, Cl. 522-35.000.
Rei, Inc.: *See*—
Brubaker, Daniel B., 5,180,661, Cl. 435-7.210.
Reick, Franklin G. High-temperature porous-ceramic superconductors. 5,180,706, Cl. 505-1.000.
Reilly Industries, Inc.: *See*—
McQuigg, Donald W.; and Sowers, Edward E., 5,180,822, Cl. 546-278.000.
Reimers, Eric W. Self propelled golf bag cart. 5,180,023, Cl. 180-19.100.
Rein, Eric. Kitty litter novelty figure. 5,180,337, Cl. 472-57.000.
Reindl, Wilhelm; and Williams, Doil, to University of Minnesota, Regents of the. Oil sorption with surface-modified rubber. 5,180,704, Cl. 502-402.000.
Reinhardt Maschinenbau GmbH: *See*—
Kutschker, Wolfgang; and Pesold, Erwin, 5,179,884, Cl. 83-156.000.
Reinhart, Douglas A.: *See*—
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Reliance Comm/Tec Corporation: *See*—
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Rendell, Michael P., to Komori Currency Technology UK Ltd. Apparatus and method for progressively coating a cylinder. 5,180,612, Cl. 427-372.200.
Renlund, Gary M.; Lewis, Larry N.; Stein, Judith; and Bracco, Angelo A., to General Electric Company. Silicon-oxy-carbide glass method of preparation and articles. 5,180,694, Cl. 501-12.000.
Rensel, John D.: *See*—
Watanabe, Isao; Rensel, John D.; and Weitzenhof, David A., 5,180,145, Cl. 267-64.240.
Renzi, Fiorenzo: *See*—
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Research Corporation Limited: *See—*
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Research Foundation of State University of New York: *See—*
Bruckenstein, Stanley; and Adinolfe, Nancy, 5,180,968, Cl. 324-71.100.

Research Triangle Institute: *See—*
Wall, Monroe E.; Wani, Mansukh C.; Nicholas, Allan W.; and Manikumar, Govindarajan, 5,180,722, Cl. 514-219.000.

Research Triangle Institute, Inc.: *See—*
Markunas, Robert J.; Hendry, Robert; and Rudder, Ronald A., 5,180,435, Cl. 118-723.000.

Restarick, Henry I.: *See—*
Ross, Colby M.; and Restarick, Henry I., 5,180,016, Cl. 166-387.000.

Reuveni, Zohar; and Eshtein, Itzhak. Pasteurizing machine. 5,179,890, Cl. 99-362.000.

REWO Chemische Werke GmbH: *See—*
Birkhan, Horst; Kohle, Hans-Juergen; Weigand, Joachim; and Wehner, Winfried, 5,180,508, Cl. 252-8.800.

Reyes, Jesus E.: *See—*
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Reynhout, Marinus J.: *See—*
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Reynolds, Joseph D.; and Stine, Alan C., to Eaton Corporation. Transmission gear retainer. 5,179,866, Cl. 74-332.000.

Reynolds, Joseph D., to Eaton Corporation. Changing speed in a power transmission. 5,179,869, Cl. 74-473.00R.

Rezac, Willard J.: *See—*
Cook, Robert G.; Runyan, Daniel J.; Rezac, Willard J.; Edds, Thomas A.; and Bilas, Ronald J., 5,180,051, Cl. 200-400.000.

Reznik, Svetlana: *See—*
Lee, J. Kelly; Reznik, Svetlana; and Regelsberger, Matthias H., 5,181,021, Cl. 340-572.000.

Rhame, Robert W., Jr. Atraumatic eye patch. 5,180,360, Cl. 602-74.000.

Rheinmetall GmbH: *See—*
Jaskolka, Heinz; Rahnenfuhrer, Eckhard; and Schulze, Albert, 5,180,883, Cl. 102-443.000.

Rheox, Inc.: *See—*
Hartman, Terrence L.; and Cody, Charles A., 5,180,802, Cl. 528-335.000.

Rhoades, Donald E., to Interactive Television Systems, Inc. Telephone access information service distribution system. 5,181,107, Cl. 358-86.000.

Rhone-Poulenc Agrochimie: *See—*
Darchy, Francois; and Zobel, Jean-Claude, 5,180,414, Cl. 504-206.000.
Gadras, Alain; and Pepin, Regis, 5,180,827, Cl. 546-14.000.

Rhone-Poulenc Nutrition Animale: *See—*
Jacquot, Roland; and Mercier, Claude, 5,180,855, Cl. 568-486.000.

Ribner, David B., to General Electric Company. High-order, plural-bit-quantization sigma-delta modulators using single-bit digital-to-analog conversion feedback. 5,181,032, Cl. 341-143.000.

Ricard, Vernon F. Odor remover device. 5,179,737, Cl. 4-213.000.

Richard, Herve : *See—*
Baudry, Alain; Junino, Alex; and Richard, Herve , 5,180,400, Cl. 8-405.000.

Richard Voss Grubenausbau GmbH: *See—*
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Richards, John W.; Pearman, James B.; and Hurley, Terry R., to Sony Corporation. Including break slots in broadcast video signals. 5,181,114, Cl. 358-146.000.

Richardson, Alan T.: *See—*
Oswald, Gordon K. A.; Neal, Christopher S.; and Richardson, Alan T., 5,181,039, Cl. 342-119.000.

Richardson, Arthur B. Expansion washer. 5,180,268, Cl. 411-536.000.

Richardson, Larry V., to Kantech Industries, Inc. Can crushing and storage unit. 5,179,893, Cl. 100-98.00R.

Richter, Axel; and Sandmeier, Herrmann, to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V. Microminiaturized electrostatic pump. 5,180,288, Cl. 417-48.000.

Ridge, Ivo B.; and Spector, George. Disposable grass catcher. 5,179,824, Cl. 56-202.000.

Riescher, Georg: *See—*
Burger, Ranier; and Riescher, Georg, 5,179,899, Cl. 101-181.000.

Rigby, Stephen D.; and Styan, Paul A., to Du Pont de Nemours, E. I., and Company. Processing radiation sensitive members with aqueous ethyl hexyl sulphate treatment prior to burn-in step. 5,180,654, Cl. 430-309.000.

Ringgenberg, Paul D.; and Manke, Kevin R., to Halliburton Company. Hydraulic lockout device for pressure controlled well tools. 5,180,015, Cl. 166-386.000.

Ringgenberg, Paul D.: *See—*
Manke, Kevin R.; Ringgenberg, Paul D.; and Schultz, Roger L., 5,180,007, Cl. 166-321.000.

Rink, William J.; Schlenoff, Joseph B.; and Mathias, Haim H. G., to Florida State University. Specimen holder. 5,181,233, Cl. 378-79.000.

Ristic, Ljubisa: *See—*
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Rivetti, Franco: *See—*
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Robert Bosch GmbH: *See—*
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Roberts, Webster C.: *See—*
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Robertson, Graham D.: *See—*
Christian, Donald J.; Robertson, Graham D.; Tucci, James M.; and Westcott, Michael J., 5,180,122, Cl. 244-134.00F.

Robinson, Douglas J. Cabinet allowing object to be viewed from multiple angles. 5,180,222, Cl. 362-125.000.

Robinson, Michael: *See—*
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Roche, Tom: *See—*
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Rockwell International Corporation: *See—*
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LaVallee, James R.; Hilsenbeck, Jerry M.; Brown, James G.; Sumner, Roger A.; Zazzera, Andre C.; and Bailey, Dana A., 5,181,236, Cl. 379-67.000.
Shafer, Tom R., 5,181,027, Cl. 340-961.000.
Sharpe, Tom G.; Styers, C. James; and Suiter, James M., 5,181,028, Cl. 340-974.000.
Simms, Tammy J.; and Whiting, Frederick J., 5,179,978, Cl. 137-625.460.
Southwell, William H., 5,181,143, Cl. 359-586.000.
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Roe, Donald C.: *See—*
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Roedel, Gunther: *See—*
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Roehm GmbH Chemische Fabrik: *See—*
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Rogers, Charles E.; and Schmidt, Gertraud A., to Union Carbide Chemicals & Plastics Technology Corporation. Crush resistant cable insulation. 5,180,889, Cl. 174-113.00R.

Rogers, D. Randall. Stretcher. 5,179,746, Cl. 5-625.000.

Rogers, Russell L.: *See—*
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Rohachuk, Ronald E.: *See—*
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Rohr, Wolfgang. Floating dredger. 5,179,793, Cl. 37-71.000.

ROLM Systems: *See—*
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Romer, Duane R.; and Pews, R. Garth, to Dow Chemical Company, The. Composition and use of dimercapto-substituted dinitriles as an antimicrobial. 5,180,740, Cl. 514-516.000.

Ronchetti, Tullo: *See—*
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Ropp, David J.: *See—*
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Rorvig, Mark E., to United States of America, National Aeronautics and Space Administration. General method of pattern classification using the two domain theory. 5,181,259, Cl. 382-36.000.

Rose, Donald J., Jr., to Hewlett-Packard Company. Electro-kinetic separation with enlarged input mixing capillary. 5,180,479, Cl. 204-299.00R.

Rosencwaig, Allan: *See—*
Fanton, Jeffrey T.; Opsal, Jon; and Rosencwaig, Allan, 5,181,080, Cl. 356-381.000.

Rosenlund, Johan. Anti-theft device. 5,180,029, Cl. 180-287.000.

Ross, Colby M.; and Restarick, Henry I., to Otis Engineering Corporation. Apparatus and method for placing and for backwashing well filtration devices in uncased well bores. 5,180,016, Cl. 166-387.000.

Ross, Gordon F., to Honeywell Inc. Mechanically adjustable current sensor and method for making same. 5,180,970, Cl. 324-117.00H.

Rosse, Francis V.: *See—*
Rowland, Bob G.; Monigold, George E., Jr.; Brendle, Robert L.; and Rosse, Francis V., 5,180,647, Cl. 429-252.000.

Rosser, David A.: *See—*
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Rosswurm, Mark A., to Cummins Power Generation, Inc. Mechanically commutated linear alternator. 5,180,939, Cl. 310-27.000.

Rostoker, Gareth: *See—*
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Rostoker, Gareth, executor: *See—*
Rostoker, William, deceased; Rostoker, Gareth; Bonini, Julius J.; and Klimczak, Gary W., 5,180,421, Cl. 75-414.000.

Rostoker, Inc.: *See*—
Rostoker, William, deceased; Rostoker, Gareth; Bonini, Julius J.; and Klimczak, Gary W., 5,180,421, Cl. 75-414.000.
Rostoker, William, deceased (by Rostoker, Gareth, executor); Rostoker, Gareth; Bonini, Julius J.; and Klimczak, Gary W., to Rostoker, Inc. Method and apparatus for recovering useful products from waste streams. 5,180,421, Cl. 75-414.000.
Roth, Stephen, to University of Pennsylvania, The Trustees of the. Saccharide compositions, methods and apparatus for their synthesis. 5,180,674, Cl. 435-288.000.
Rourke, William J.: *See*—
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Roussel Uclaf: *See*—
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Blade, Robert J., 5,180,737, Cl. 514-463.000.
Rousset, Jacky; and Ravet, Georges, to Coatex S.A. Water soluble complexing agent for metallic cations. 5,180,790, Cl. 525-329.600.
Rowland, Bob G.; Monigold, George E., Jr.; Brendle, Robert L.; and Rosse, Francis V., to Evanite Fiber Corporation. Battery separator and method of making same. 5,180,647, Cl. 429-252.000.
Rubbermaid Incorporated: *See*—
Conaway, Brian J.; and Keyes, Tyrone M., 5,180,067, Cl. 211-119.000.
Rubin, Bruce J., to Eastman Kodak Company. Development apparatus having an extended development nip. 5,181,075, Cl. 355-259.000.
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Rudisel, Rick. Ignition switch bypass circuit. 5,180,924, Cl. 307-10.600.
Ruetz, Peter: *See*—
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Rule, Mark: *See*—
Bagrodia, Shriram; Fagerburg, David R.; Gedon, Steven; Watkins, Joseph J.; Lawrence, Paul B.; and Rule, Mark, 5,180,775, Cl. 525-64.000.
Rumack, Michael: *See*—
Shorr, Leonard M.; Fishler, Theodor M.; Yanay, Shaul; and Rumack, Michael, 5,180,787, Cl. 525-282.000.
Rung, Robert; and Dole, Douglas R., to Victaulic Company of America. Elastomer-lined metal pipe. 5,180,193, Cl. 285-55.000.
Runge, Louis L.: *See*—
Gehrs, Donald F.; and Runge, Louis L., 5,181,165, Cl. 361-355.000.
Runyan, Daniel J.: *See*—
Cook, Robert G.; Runyan, Daniel J.; Rezac, Willard J.; Edds, Thomas A.; and Bilas, Ronald J., 5,180,051, Cl. 200-400.000.
Ruoslahti, Erkki I., to La Jolla Cancer Research Foundation. Versican, versican core protein, nucleic acid sequences encoding the same, nucleic acid probes, anti-versican antibodies, and methods of detecting the same. 5,180,808, Cl. 530-350.000.
Ruoslahti, Erkki I.; Engvall, Eva; and Gehlsen, Kurt R., to La Jolla Cancer Research Foundation. Adhesion receptor for laminin and its use. 5,180,809, Cl. 530-350.000.
Ruprecht, Jurg P.: *See*—
Neeser, Fredy D.; Hufschmid, Markus D.; and Ruprecht, Jurg P., 5,181,225, Cl. 375-1.000.
Russell, Mark: *See*—
Hanson, Gunnar J.; Baran, John S.; Weissing, Dave; and Russell, Mark, 5,180,725, Cl. 514-249.000.
Hanson, Gunnar J.; Baran, John S.; Weissing, Dave; and Russell, Mark, 5,180,744, Cl. 514-616.000.
Ruzicka, Lawrence M.: *See*—
Schultz, Gary R.; and Ruzicka, Lawrence M., 5,180,456, Cl. 152-416.000.
RXS Schrumpftechnik-Garnituren GmbH: *See*—
Heier, Manfred; Brudermann, Uwe; and Kipfelsberger, Christian, 5,180,621, Cl. 428-138.000.
Ryan, Gary: *See*—
Griffiths, Gareth; Warm, Aleksander; Previdoli, Felix; and Ryan, Gary, 5,180,826, Cl. 544-332.000.
Rydell, Earl E.: *See*—
Walser, Robert A.; and Rydell, Earl E., 5,181,202, Cl. 370-85.150.
Saarinen, Sulevi, to Tunturipyora Oy. Resistance mechanism. 5,180,348, Cl. 482-6.000.
Sabrsula, Donald J.: *See*—
Cunkle, Glen T.; Ravichandran, Ramanathan; and Sabrsula, Donald J., 5,180,829, Cl. 546-188.000.
Saceman, Don F., to Affiliated Innovation Management, Inc. Room air purification. 5,180,552, Cl. 422-1.000.
Sacripante, Guerino G.; and Veregin, Richard P. N., to Xerox Corporation. Toner compositions with conductive colored magnetic particles. 5,180,650, Cl. 430-106.600.
SAES Getters SpA: *See*—
Boffito, Claudio; and Bolognesi, Massimo, 5,180,568, Cl. 423-248.000.
Saferstein, Lowell: *See*—
Boardman, Franklin; and Saferstein, Lowell, 5,180,398, Cl. 8-181.000.
Saiki, Yoshifumi: *See*—
Yoda, Sumio; Futamura, Nobuyuki; Hashimoto, Matsuo; and Saiki, Yoshifumi, 5,180,794, Cl. 525-487.000.
Saita, Yoshiaki; Kuwahara, Seiji; and Sato, Yoshinori, to Seiko Instruments Inc. Thermal head. 5,181,046, Cl. 346-76.0PH.
Saito, Akihisa: *See*—
Shiomi, Kazuyuki; Tanaka, Mitsuharu; Kiku, Kazuomi; and Saito, Akihisa, 5,180,319, Cl. 440-52.000.
Saito, Hirosi: *See*—
Chazono, Hirokazu; Honda, Mutsumi; Kisi, Hirosi; Saito, Hirosi; and Shizuno, Hisamitsu, 5,181,157, Cl. 361-321.000.
Saito, Kazuo: *See*—
Takaku, Akira; Hashimoto, Toshimasa; Suzuki, Toshio; Takahashi, Yutaka; and Saito, Kazuo, 5,180,529, Cl. 264-29.600.
Saito, Kimitoshi: *See*—
Ozawa, Yoshio; Matsumoto, Takashi; and Saito, Kimitoshi, 5,181,066, Cl. 355-29.000.
Saito, Muneo; and Yamauchi, Yoshio, to Nihon Bunko Kogyo Kabushiki Kaisha. Pump apparatus for transferring a liquified gas used in a recycle chromatograph. 5,180,487, Cl. 210-198.200.
Saito, Tetsuya, to Canon Kabushiki Kaisha. Impact printer with variable impact and rebound control. 5,180,235, Cl. 400-167.000.
Saka, Kazuhito: *See*—
Iura, Kazuo; Yamano, Yoshiaki; and Saka, Kazuhito, 5,179,779, Cl. 29-877.000.
Sakai Chemical Industry Co., Ltd.: *See*—
Terada, Yasuhiko; Abe, Kazunobu; Uno, Hajime; and Shirasaki, Shinichi, 5,180,699, Cl. 501-134.000.
Yoshimoto, Masafumi; Nakatsuji, Tadao; and Yoshida, Kimihiko, 5,180,567, Cl. 423-239.000.
Sakai, Hideki; and Yamamoto, Yohzoh, to Mitsui Petrochemical Industries, Ltd. Flame retardant cyclic olefinic polymer composition. 5,180,767, Cl. 524-411.000.
Sakakibara, Shiro; Inuzuka, Takeshi; Hattori, Masashi; Fukatsu, Hironari; and Takaki, Shinichi, to Aisin AW Co., Ltd. Automatic transmission for vehicle. 5,179,867, Cl. 74-335.000.
Sakakibara, Yasuyuki; Makinouchi, Susumu; Magome, Nobutaka; and Shiraishi, Naomasa, to Nikon Corporation. Projection exposure apparatus. 5,181,067, Cl. 355-43.000.
Sakamoto, Kiichi: *See*—
Oae, Yoshihisa; Sakamoto, Kiichi; and Yasuda, Hiroshi, 5,180,919, Cl. 250-492.200.
Sakamoto, Noriyasu: *See*—
Tomioka, Hiroki; Sakamoto, Noriyasu; Umeda, Kimitoshi; Fujimoto, Hiroaki; Ishiwatari, Takao; and Kisida, Hirosi, 5,180,732, Cl. 514-396.000.
Sakamoto, Satoshi: *See*—
Tarumi, Yoshihiko; Takekoshi, Atuhisa; Inaba, Mamoru; Nishi, Yoshiro; Sakurai, Masaaki; Sakamoto, Satoshi; and Sato, Kimihiko, 5,180,228, Cl. 374-139.000.
Sakata, Junichiro: *See*—
Moriya, Iwao; Sugie, Masayuki; Iwasaki, Masayoshi; and Sakata, Junichiro, 5,180,603, Cl. 426-556.000.
Sakata, Kei: *See*—
Masui, Susumu; Sakata, Kei; and Togashi, Fusao, 5,180,449, Cl. 148-533.000.
Sakaya, Kazuhiro; and Kodama, Shoichi, to Kabushiki Kaisha Toshiba. Apparatus for transferring semiconductor wafers. 5,180,273, Cl. 414-404.000.
Sakiyama, Keizo: *See*—
Yamauchi, Yoshimitsu; Tanaka, Kenichi; Sakiyama, Keizo; and Fukumoto, Katsumi, 5,181,188, Cl. 365-228.000.
Sakno, Michael, to Instant Firestop Inc. Fire-stop sealant kit. 5,180,063, Cl. 206-582.000.
Sakura Color Products Corporation: *See*—
Sumii, Masaaki, 5,180,637, Cl. 428-402.210.
Sakuragi, Satoshi; Ikeda, Takeshi; and Kuroda, Takashi, to Murata Mfg. Co., Ltd. Data circuit-terminating equipment with power source device. 5,181,240, Cl. 379-98.000.
Sakurai, Hisao; and Nishiyama, Seiichi, to Sony Corporation. Wideband amplifier. 5,180,989, Cl. 330-295.000.
Sakurai, Masaaki: *See*—
Tarumi, Yoshihiko; Takekoshi, Atuhisa; Inaba, Mamoru; Nishi, Yoshiro; Sakurai, Masaaki; Sakamoto, Satoshi; and Sato, Kimihiko, 5,180,228, Cl. 374-139.000.
Salchenberger, Samuel M.: *See*—
Dowden, Douglas C.; Hemmeter, Richard W.; Herr, Diane E.; McCormick, William K.; Petrelli, Robert; Piereth, Richard J.; Salchenberger, Samuel M.; Sehgal, Chander S.; and Verma, Mahendra K., 5,181,237, Cl. 379-88.000.
Saltwick, John M.; Scarinci, Dean; Sparks, William O.; and Gates, Geoffrey W., to Syntellect, Inc. System and method for communications security protection. 5,181,243, Cl. 380-6.000.
Salvagnini, Guido, to Salvagnini S.p.A. Device for supporting and transporting a metal sheet in relation to a workstation at which the metal sheet is to be punched and/or sheared. 5,180,049, Cl. 198-699.100.
Salvagnini S.p.A.: *See*—
Salvagnini, Guido, 5,180,049, Cl. 198-699.100.
Salvucci, Frank S. Gas cylinder cart removable handle. 5,180,179, Cl. 280-47.315.
Sam, Richard C.; Leslie, Kenrick R.; and Goodwin, James E. Heated solid state laser. 5,181,215, Cl. 372-34.000.
Samsonite Corporation: *See*—
Franklin, Dana, 5,180,057, Cl. 206-279.000.
Samsumg Electronics Co., Ltd.: *See*—
Han, Tack D.; and Moh, Sang M., 5,181,185, Cl. 364-760.000.
Samsung Electron Devices Co., Ltd.: *See*—
Kweon, Yong-geol, 5,180,945, Cl. 315-14.000.
Samsung Electronics Co., Ltd.: *See*—
Cha, Dong-il, 5,181,048, Cl. 346-76.0PH.

Choi, Hae Y.; and Lee, Joon H., 5,181,117, Cl. 358-169.000.
Choi, Yun-ho, 5,180,928, Cl. 307-296.600.
Kim, Jong-woo; and Jang, Ki-sun, 5,180,233, Cl. 400-120.000.
Ko, Kwang-Ok; and Park, Jong-Ho, 5,180,468, Cl. 156-644.000.
Moon, Seung H.; and Yoon, Yung S., 5,181,085, Cl. 257-94.000.
Shim, Dae-Yoon; and Lim, Jong-Sang, 5,181,184, Cl. 364-758.000.
Sin, Yun-seung, 5,180,938, Cl. 307-605.000.

Samuels, Sam L.: *See*—
Jacobson, Howard W.; Schollа, Michael H.; and Samuels, Sam L., 5,180,585, Cl. 424-405.000.

Sanai, Deborah S.: *See*—
Polefka, Thomas G.; Sanai, Deborah S.; and Jannone, Brian S., 5,180,577, Cl. 424-52.000.

Sanden Corporation: *See*—
Sasaki, Kenichi; and Sokolowski, Janusz, 5,179,845, Cl. 62-515.000.

Sanderson, John R.; and Knifton, John F., to Texaco Chemical Company. Process for oligomerizing olefins using an aluminum nitrate-treated acidic clay. 5,180,864, Cl. 585-10.000.

Sanderson, John R.; Crawford, Wheeler C.; and McCoy, David R., to Texaco Chemical Company. Process for preparing synthetic lubricant base stocks having improved viscosity from vinylcyclohexene and long-chain olefins. 5,180,866, Cl. 585-12.000.

Sanderson, John R.; and Marquis, Edward T., to Texaco Chemical Company. Process for co-reacting poly(isobutylene) and linear olefins to prepare synthetic lubricant base stocks having improved properties. 5,180,869, Cl. 585-255.000.

Sandmeier, Herrmann: *See*—
Richter, Axel; and Sandmeier, Herrmann, 5,180,288, Cl. 417-48.000.

Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshiteru; Nakano, Eiichi; and Ishidoshiro, Hiroshi, 5,180,497, Cl. 210-665.000.
Sando, Yoshiteru; Nakano, Eiichi; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Method for decolorization of waste water. 5,180,497, Cl. 210-665.000.

Sanekata, Kiyonari: *See*—
Sugaya, Yoshio; Terada, Ichiro; Sanekata, Kiyonari; and Horie, Hirofumi, 5,180,750, Cl. 521-32.000.

Sango Co.: *See*—
Shirasawa, Hidenori; Tanaka, Yoshiki; and Sawaki, Shinji, 5,180,204, Cl. 296-146.00C.

Sano, Eiichi; and Minegishi, Hiroshi, to Kabushiki Kaisha Topcon. Fundus camera. 5,181,055, Cl. 354-62.000.

Sansevero, Frank M.: *See*—
Barrett, Dale R.; Nguyen, Dat; and Sansevero, Frank M., 5,180,047, Cl. 198-335.000.

Sanwa Kagaku Kenkyusho Co., Ltd.: *See*—
Sawai, Kiichi; Kurono, Masayasu; Mitani, Takahiko; Nagabuchi, Masanori; and Anzai, Keizo, 5,180,739, Cl. 514-491.000.

Sanyo Electric Co., Ltd.: *See*—
Aiga, Masayuki; and Shibata, Yoshitaka, 5,180,946, Cl. 315-39.510.
Tsujino, Kazuhiro, 5,180,961, Cl. 320-20.000.

Sanyo-Kokusaku Pulp Co., Ltd.: *See*—
Kimura, Tadao; Takahashi, Toshihide; and Shimizu, Kazuo, 5,180,791, Cl. 525-358.000.

Sapiejewski, Roman; and Breen, John J., to Bose Corporation. High compliance headphone driving. 5,181,252, Cl. 381-187.000.

Sarrine, Robert J., to Helena Laboratories Corporation. Biological fluid connection and delivery apparatus and method. 5,179,960, Cl. 128-764.000.

Sartori, Guido; Ho, W. S. Winston; and Noone, Robert E., to Exxon Research and Engineering Company. Unsaturated polyesters and crosslinked membranes therefrom for aromatics/saturates separation. 5,180,496, Cl. 210-654.000.

Sasaki, Katsunari, to Kabushiki Kaisha Toshiba. Thermal head. 5,181,047, Cl. 346-76.0PH.

Sasaki, Kenichi; and Sokolowski, Janusz, to Sanden Corporation. Heat exchanger. 5,179,845, Cl. 62-515.000.

Sasaki, Masatomi; and Kashiwagi, Nobuyoshi, to Terumo Kabushiki Kaisha. Medical materials and process for preparing the same. 5,180,789, Cl. 525-326.300.

Sasaki, Mitsuo: *See*—
Nakamura, Ei; Sasaki, Mitsuo; and Nakamura, Hiromi, 5,180,609, Cl. 427-595.000.
Yamaoka, Fumiyuki; Sasaki, Mitsuo; Nakazawa, Chiharu; and Sugiyama, Hiroyuki, 5,180,129, Cl. 248-230.000.

Sasaki, Takao; Fujibayashi, Kentaro; and Miyake, Masahiko, to Fanuc Ltd. Spindle control command method. 5,181,178, Cl. 364-474.110.

Satco, Inc.: *See*—
Looker, Robert, 5,180,078, Cl. 220-665.000.

Sato, Kimihiko: *See*—
Tarumi, Yoshihiko; Takekoshi, Atuhisa; Inaba, Mamoru; Nishi, Yoshiro; Sakurai, Masaaki; Sakamoto, Satoshi; and Sato, Kimihiko, 5,180,228, Cl. 374-139.000.

Sato, Koji; Suzuki, Tokio; Kamiya, Hajime; Nakamura, Kimio; Kosaka, Masahisa; and Ohsora, Tetsuo, to Hoya Corporation. Anti-reflection optical element. 5,181,141, Cl. 359-580.000.

Sato, Koji: *See*—
Sugiyama, Ikuo; Ishibashi, Kazuhisa; Takakusaki, Nobuyuki; Maruhashi, Yoshitsugu; Nishimura, Yasushi; Koyama, Hiroshi; Iida, Setsuko; and Sato, Koji, 5,180,893, Cl. 219-10.430.

Sato, Kozo: *See*—
Yamaguchi, Jun; Ishige, Sadao; Sato, Kozo; Washizu, Shintaro; and Itoh, Isamu, 5,180,652, Cl. 430-281.000.

Sato, Kunio; Akimaru, Susumu; Hoshi, Nobuyoshi; and Hori, Yasuro, to Hitachi, Ltd. Electronic blackboard. 5,181,129, Cl. 358-494.000.

Sato, Masahiko: *See*—
Hoyano, Yuhei; and Sato, Masahiko, 5,179,904, Cl. 112-67.000.

Sato, Masanori: *See*—
Urayama, Kiyoshi; and Sato, Masanori, 5,180,116, Cl. 242-71.800.

Sato, Motohiro: *See*—
Okada, Ryoji; Sato, Motohiro; Yamada, Toshihiro; and Kuwabara, Heikichi, 5,180,001, Cl. 165-80.400.

Sato, Shinichi: *See*—
Tanaka, Kimio; Sato, Shinichi; Satoh, Takateru; and Shiba, Haruo, 5,180,118, Cl. 242-199.000.

Sato, Shuichi: *See*—
Komori, Mikio; Adachi, Kazuyu; and Sato, Shuichi, 5,179,965, Cl. 131-281.000.

Sato, Toshiya; and Hata, Hamako, to Takasago International Corporation. Acaricidal composition. 5,180,586, Cl. 424-405.000.

Sato, Yoshiaki: *See*—
Isowa, Yoshikazu; Sato, Yoshiaki; Nakashima, Yoshiharu; Masaki, Mitsuo; Miyake, Norihisa; Uehara, Masaki; and Hirate, Kenji, 5,180,712, Cl. 514-16.000.

Sato, Yoshinori: *See*—
Saita, Yoshiaki; Kuwahara, Seiji; and Sato, Yoshinori, 5,181,046, Cl. 346-76.0PH.

Sato, Yukio; Suzuki, Akihiro; Inoue, Mitsuo; Haruta, Kenyu; and Nagai, Haruhiko, to Mitsubishi Denki Kabushiki Kaisha. Laser oscillator circuit. 5,181,217, Cl. 372-38.000.

Satoh, Ryo: *See*—
Kazuo, Yoshimura; and Satoh, Ryo, 5,180,892, Cl. 200-61.45M.

Satoh, Shinichi: *See*—
Eimori, Takahisa; Wakamiya, Wataru; Ozaki, Hiroji; Tanaka, Yoshinori; and Satoh, Shinichi, 5,181,094, Cl. 257-372.000.
Wakamiya, Wataru; Tanaka, Yoshinori; Eimori, Takahisa; Ozaki, Hiroji; Kimura, Hiroshi; and Satoh, Shinichi, 5,180,683, Cl. 437-47.000.

Satoh, Takateru: *See*—
Tanaka, Kimio; Sato, Shinichi; Satoh, Takateru; and Shiba, Haruo, 5,180,118, Cl. 242-199.000.

Sauer, Robert D.; and Jamal, Mustafa M., to Kimberly-Clark Corporation. Non-nesting multi-ply tissue and method for making same. 5,180,471, Cl. 162-112.000.

Sawada, Koji: *See*—
Yamamoto, Toshio; and Sawada, Koji, 5,180,322, Cl. 445-37.000.

Sawai, Kiichi; Kurono, Masayasu; Mitani, Takahiko; Nagabuchi, Masanori; and Anzai, Keizo, to Sanwa Kagaku Kenkyusho Co., Ltd. Use of 3-oxygermylpropionic acid to treat and prevent diabetes-dependent type of autoimmune diseases. 5,180,739, Cl. 514-491.000.

Sawaki, Shinji: *See*—
Shirasawa, Hidenori; Tanaka, Yoshiki; and Sawaki, Shinji, 5,180,204, Cl. 296-146.00C.

Sawamoto, Isao: *See*—
Nishiki, Yoshinori; Sawamoto, Isao; Nakamatsu, Shuji; and Shimamune, Takayuki, 5,180,502, Cl. 210-748.000.

Sawamura, Norio: *See*—
Yokoyama, Hitoshi; Sawamura, Norio; and Motobayashi, Noriko, 5,180,596, Cl. 426-36.000.

Sawyer, Philip N.; and Freeman, Leon D. Anti-thrombotic compounds. 5,180,839, Cl. 549-316.000.

Scalise, Stanley: *See*—
Davis, Dennis W.; and Scalise, Stanley, 5,181,138, Cl. 359-239.000.

Scanlon, Thomas A. Combination headset and face mask device. 5,179,736, Cl. 2-209.000.

Scarinci, Dean: *See*—
Saltwick, John M.; Scarinci, Dean; Sparks, William O.; and Gates, Geoffrey W., 5,181,243, Cl. 380-6.000.

Schaevitz Sensing Systems, Inc.: *See*—
Swartz, Harold L.; Stansberry, Warren W.; Heidel, Jeffrey C.; and Carlson, Bradley D., 5,180,986, Cl. 324-660.000.

Schairer, Werner: *See*—
Bommer, Ulrich; and Schairer, Werner, 5,181,084, Cl. 257-94.000.

Scharnowski, Gerhard: *See*—
Moller, Rudolf; Brausfeld, Walter; Gottling, Helmut; Scharnowski, Gerhard; and Muller, Peter, 5,180,318, Cl. 439-716.000.

Schauss, Craig A.; Neumann, Donald E.; and Bielawski, Dennis A., to General Dynamics Land Systems Inc. Interface chip device. 5,181,201, Cl. 370-85.100.

Schendel, Robert E.; and Leinen, Chris M., to Topworks, Inc. Split clamp linear solenoid valve positioner. 5,179,888, Cl. 91-387.000.

Schendel, Robert E.: *See*—
Leinen, Chris M.; and Schendel, Robert E., 5,179,887, Cl. 91-387.000.

Schering Corporation: *See*—
Gala, Dinesh; Steinman, Martin; and Ganguly, Ashit, 5,180,823, Cl. 544-212.000.

Schick, David; and Bane, Mark. Self verifying transaction card with disabling capability. 5,180,902, Cl. 235-380.000.

Schiller, Richard F., to Sony Broadcast and Communications Ltd. Three channel audio transmission and/or reproduction systems. 5,181,249, Cl. 381-27.000.

Schlenoff, Joseph B.: *See*—
Rink, William J.; Schlenoff, Joseph B.; and Mathias, Haim H. G., 5,181,233, Cl. 378-79.000.

Schlumberger Canada Limited: *See*—
Howell, Chesley R., 5,181,166, Cl. 361-364.000.

Schlumberger Technology Corporation: *See*—
Wraight, Peter D., 5,180,917, Cl. 250-374.000.

Schmid, Hans G. Manually operated aerosol sprayer. 5,180,085, Cl. 222-211.000.

Schmidt, Gertraud A.: *See*—
Rogers, Charles E.; and Schmidt, Gertraud A., 5,180,889, Cl. 174-113.00R.
Schmidt, Glenn H.; Sheehan, John P.; and Helmstetter, Richard C., to Callaway Golf Company. Hollow, metallic golf club head with dendritic structure. 5,180,166, Cl. 273-167.00F.
Schmidt, Guenther: *See*—
Bernhardt, Wolfgang; Holzmann, Roland; Schmidt, Guenther; Kirstein, Lothar; and Wetzel, Gerhard, 5,180,215, Cl. 303-113.200.
Schmidt, Reinhard, to R. Schmidt GmbH. Headrest for use in motor vehicles having pivot members, resilient strip and friction bands. 5,180,207, Cl. 297-408.000.
Schmidtberger, Rudolf, to Behringwerke Aktiengesellschaft. Diagnostic agent and a method for the determination of apolipoprotein B. 5,180,679, Cl. 436-518.000.
Schneid, Josef: *See*—
Hinz, Joachim; Schneid, Josef; Steidele, Andreas; Volz, Karl; and Stotz, Wolf-Gunter, 5,179,894, Cl. 100-163.00A.
Schneider, Eckhard; and Gawinski, Hubertus, to Continental Aktiengesellschaft. Rolling piston for a roll bellows of a roll bellows-type pneumatic shock absorber. 5,180,146, Cl. 267-64.270.
Schneider, Hans-Christoph: *See*—
Skatulla, Luzian; Vollmer, Hans-Jurgen; and Schneider, Hans-Christoph, 5,180,474, Cl. 203-84.000.
Schoen, Rudolf R.: *See*—
Aldridge, Tod; Fitzgerald, John A.; McGregor, Allan K.; Quates, Ronald D.; Schoen, Rudolf R.; Thangarasu, Appavoo; and Vicic, John C., 5,180,008, Cl. 166-84.000.
Scholla, Michael H.: *See*—
Jacobson, Howard W.; Scholla, Michael H.; and Samuels, Sam L., 5,180,585, Cl. 424-405.000.
Schon B.V.: *See*—
Schon, Siegfried J., 5,179,989, Cl. 160-84.100.
Schon, Siegfried J., to Schon B.V. Device for transmitting a drive force between a flexible element and a rotatable body. 5,179,989, Cl. 160-84.100.
Schonfeld, Dieter, to MTU Motoren- und Turbinen-Union, Friedrichshafen. Piston with a rotatable piston top. 5,179,916, Cl. 123-48.00B.
Schreiber, Christopher M.; and Crumly, William R., to Hughes Aircraft Company. Resilient interconnection bridge. 5,180,311, Cl. 439-74.000.
Schreiber, Wolfgang, to C. & E. Fein GmbH & Co. Motor-operated tool. 5,180,261, Cl. 408-239.00R.
Schroeder, Richard L., to Giddings & Lewis, Inc. Drill grinding machine. 5,179,809, Cl. 51-288.000.
Schubert, Erhard: *See*—
Steiner, Gerd; Weniger, Rudi; Braun, Rolf; Otterbach, Rainer; Schubert, Erhard; and Hofmann, Ralf, 5,181,257, Cl. 382-17.000.
Schultheiss, Roger; and Zwicky, Paul, to Studer Revox AG. Amplifier unit. 5,181,251, Cl. 381-96.000.
Schultz, Allen L.: *See*—
McLane-Goetz, Lee A. M.; Laramie, Matthew J.; McClelland, Kevin L.; McCormick, Robert L.; and Schultz, Allen L., 5,180,279, Cl. 415-177.000.
Schultz, Darald R.: *See*—
Chadima, George E., Jr.; and Schultz, Darald R., 5,180,232, Cl. 400-88.000.
Schultz, Duane R.: *See*—
Watanabe, Kazuo; Tuchida, Toshio; and Schultz, Duane R., 5,180,743, Cl. 514-565.000.
Schultz, Gary R.; and Ruzicka, Lawrence M., to Eaton Corporation. Adaptive inflation control for vehicle central tire inflation system. 5,180,456, Cl. 152-416.000.
Schultz, Gary R.: *See*—
Hicks, Bradford W.; Blust, Brian R.; Beverly, James A.; and Schultz, Gary R., 5,179,981, Cl. 141-4.000.
Schultz, Roger L.: *See*—
Manke, Kevin R.; Ringgenberg, Paul D.; and Schultz, Roger L., 5,180,007, Cl. 166-321.000.
Schulz, Terry L.: *See*—
Conway, Lawrence E.; and Schulz, Terry L., 5,180,543, Cl. 376-282.000.
Schulze, Albert: *See*—
Jaskolka, Heinz; Rahnenfuhrer, Eckhard; and Schulze, Albert, 5,180,883, Cl. 102-443.000.
Schupp, Alfred. Apparatus for use in refueling marine tanks. 5,181,022, Cl. 340-616.000.
Schwager, Harald: *See*—
Haardt, Udo; Seiler, Erhard; Tatzel, Hermann; Schwager, Harald; and Domas, Friedrich, 5,180,628, Cl. 428-215.000.
Schwartz, Robert E.; and Trimble, Robert R., to John Zink Company, a Division of Koch Engineering Company, Inc. Radiant gas burner and method. 5,180,302, Cl. 431-348.000.
Schwartzbauer, Neil J.; and Laska, Douglas J., to Minnesota Mining and Manufacturing Company. Single use spray dispensing assembly. 5,180,109, Cl. 239-346.000.
Schwarz, Hans-Helmut; Braden, Rudolf; Marhold, Albrecht; and Negele, Michael, to Bayer Aktiengesellschaft. Process for the preparation of polychloro-fluoro-cyclo-pentenes. 5,180,861, Cl. 570-160.000.
Schwarz, Martial, to Michelin & Cie. Cylinder for rubber mixing mill. 5,180,002, Cl. 165-89.000.
Schwarz, Michael: *See*—
Heywang, Ulrich; Casutt, Michael; and Schwarz, Michael, 5,180,837, Cl. 548-315.400.
Schweitzer, Edmund O., Jr. Housing including biasing springs extending between clamp arms for cable mounted power line monitoring device. 5,180,972, Cl. 324-127.000.
Schweizer, Philipp F.; and Petlevich, Walter J., Jr., to Westinghouse Electric Corp. Method for automatically identifying targets in sonar images. 5,181,254, Cl. 382-1.000.
Schwendemann, Kenneth L.: *See*—
Dickson, Rennie L.; Godfrey, Craig W.; Schwendemann, Kenneth L.; and Noack, Timothy J., 5,179,973, Cl. 137-433.000.
Schwitzky, Volkmar R., to Koenig & Bauer Aktiengesellschaft. Controllable gripper assembly. 5,179,900, Cl. 101-240.000.
Scott, Robert J.: *See*—
Dutcher, Robert G.; Packard, Brian M.; and Scott, Robert J., 5,179,962, Cl. 128-785.000.
Scripps Research Institute, The: *See*—
Dillner, Joakim; Lerner, Richard A.; Smith, Richard; and Parks, D. Elliot, 5,180,806, Cl. 530-326.000.
Seagate Technology Inc.: *See*—
Yan, Ying D.; Bortins, John; Keel, Beat G.; and Amin, Nurul, 5,181,152, Cl. 360-126.000.
Seaward, David R.: *See*—
Cahill, Michael J.; Patchett, Jeffrey J.; Seaward, David R.; Shirley, Graham L.; and Vernon, Geoffrey W., 5,179,815, Cl. 53-133.300.
Sebag, Claude; and Dubief, Claude, to L'Oreal. Washing compositions based on insoluble silicones and on a surface-active agent of the polyoxyalkylenated carboxylic ether acid type, and their application in cosmetics and in dermatology. 5,180,584, Cl. 424-401.000.
Sedepro: *See*—
Dailliez, Olivier; and Mayet, Jean-Claude, 5,180,462, Cl. 156-397.000.
Segawa, Masanori: *See*—
Ogata, Masatsugu; Sugawara, Yasuhide; Segawa, Masanori; Abe, Hidetoshi; and Horie, Osamu, 5,181,097, Cl. 257-788.000.
Seguela, Brigitte; and Kaifasz, Patrick, to Atochem. Compositions containing ethylene copolymers and resultant products. 5,180,783, Cl. 525-198.000.
Sehgal, Chander S.: *See*—
Dowden, Douglas C.; Hemmeter, Richard W.; Herr, Diane E.; McCormick, William K.; Petrelli, Robert; Piereth, Richard J.; Salchenberger, Samuel M.; Sehgal, Chander S.; and Verma, Mahendra K., 5,181,237, Cl. 379-88.000.
Seiko Epson Corporation: *See*—
Maruo, Yutaka, 5,181,090, Cl. 257-344.000.
Mori, Katsumi; Asaka, Tatsuya; and Iwano, Hideaki, 5,181,219, Cl. 372-45.000.
Mori, Katsumi; Asaka, Tatsuya; and Iwano, Hideaki, 5,181,221, Cl. 372-46.000.
Takeuchi, Masahiro, 5,180,682, Cl. 437-44.000.
Seiko Instruments Inc.: *See*—
Saita, Yoshiaki; Kuwahara, Seiji; and Sato, Yoshinori, 5,181,046, Cl. 346-76.0PH.
Seikosha Co., Ltd.: *See*—
Tagami, Shigeru; Akimoto, Kazuo; Ito, Kanji; and Matsushita, Katsuhiko, 5,181,063, Cl. 354-435.000.
Tagami, Shigeru; Akimoto, Kazuo; Matsushita, Katsuhiko; and Ito, Kanji, 5,181,064, Cl. 354-437.000.
Seiler, Erhard: *See*—
Haardt, Udo; Seiler, Erhard; Tatzel, Hermann; Schwager, Harald; and Domas, Friedrich, 5,180,628, Cl. 428-215.000.
Taubitz, Christof; Seiler, Erhard; Boehlke, Klaus; and Lausberg, Dietrich, 5,180,778, Cl. 525-74.000.
Seitz, Michael R.: *See*—
Stansbury, Randall R.; and Seitz, Michael R., 5,180,093, Cl. 228-1.100.
Seitz, Reinhold; and Weidner, Hans-Jurgen, to U.S. Philips Corporation. Accommodation device for assembly units. 5,181,168, Cl. 361-427.000.
Seki, Hiroyuki; and Kimura, Atsushi, to Canon Kabushiki Kaisha. Vibration driven motor apparatus. 5,180,941, Cl. 310-323.000.
Seki, Kameharu; Kawakami, Shin; and Kubo, Isamu, to Nippon CMK Corp. Etching method of forming microcircuit patterns on a printed circuit board. 5,180,465, Cl. 156-640.000.
Sekiya, Hiroshi: *See*—
Nakagaki, Nobufumi; Kurita, Toshiyuki; Murata, Toshinori; Kaizaki, Kazuhiro; Kubota, Sadao; Kamiya, Masanori; Sekiya, Hiroshi; and Fujiwara, Kenichi, 5,181,116, Cl. 358-159.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei; and Mase, Akira, 5,181,131, Cl. 359-56.000.
Sempio, Carlo; Anghileri, Andrea; Binaghi, Marc; Ronchetti, Tullo; and Vailati, Italo, to Elf Atochem Italia S.r.l. Coextruded multilayer and a process for preparing the same. 5,180,634, Cl. 428-336.000.
Senapati, Nagabhusan: *See*—
Hsieh, Paonan; McComis, William T.; Senapati, Nagabhusan; Stulen, Foster B.; and Paul, Darrell D., 5,180,600, Cl. 426-233.000.
Sendijarevic, Aisa: *See*—
Edenbaum, Martin; Frisch, Kurt C.; Sendijarevic, Aisa; and Wong, Shaio-wen, 5,180,632, Cl. 428-253.000.
Sendzimir, Michael G.: *See*—
Turley, John W.; and Sendzimir, Michael G., 5,179,851, Cl. 72-7.000.
Seo, Jung-Yoon. Anti-skid tire apparatus. 5,180,454, Cl. 152-229.000.
Sequoia Semiconductor, Inc.: *See*—
Skripek, Michael R., 5,180,926, Cl. 307-272.300.

Sgrignoli, Gary J.: *See*—
Citta, Richard W.; Halozan, Scott F.; and Sgrignoli, Gary J., 5,181,112, Cl. 358-141.000.

SGS-Thomson Microelectronics, Inc.: *See*—
Bryant, Frank R.; and Waters, John L., 5,180,688, Cl. 437-195.000.

SGS-Thomson Microelectronics S.r.l.: *See*—
Poletto, Vanni, 5,180,927, Cl. 307-272.300.

SGS-Thomson Microelectronics S.A.: *See*—
Mouret, Michel, 5,181,035, Cl. 341-161.000.
Pezzani, Robert, 5,181,083, Cl. 257-491.000.

Shafe, Jeff; Straley, O. James; McCarty, Gordon; Oswal, Ravinder K.; and Dharia, Amitkumar N., to Raychem Corporation. Method of making an electrical device comprising a conductive polymer composition. 5,181,006, Cl. 338-22.00R.

Shafer, Tom R., to Rockwell International Corporation. Method and apparatus for an air traffic control system. 5,181,027, Cl. 340-961.000.

Shaffer, Joseph W.: *See*—
Vassiliadis, Arthur; Shaffer, Joseph W.; Fullmer, David J.; Brewer, Michael H.; Hennings, David R.; and Myers, Terry D., 5,180,304, Cl. 433-224.000.

Shah, Dinesh. Electrostatic charge dissipating electrical wire assembly and process for using same. 5,180,885, Cl. 174-36.000.

Shapiro, Leonid: *See*—
Marshall, Roger N.; Hauck, Lane T.; Shapiro, Leonid; Busch, Jeffrey W.; and Stevens, Eric S., 5,181,015, Cl. 340-706.000.

Sharp, Bruce R. Storage tank system having an internal overfill means. 5,179,984, Cl. 141-198.000.

Sharp Kabushika Kaisha: *See*—
Kamiya, Shin, 5,181,256, Cl. 382-14.000.

Sharp Kabushiki Kaisha: *See*—
Matsumoto, Toshio; Yasuda, Shuhei; Kusada, Tokutarou; and Nagashima, Nobuyoshi, 5,181,121, Cl. 358-236.000.
Okamoto, Mitsuo; Kodama, Hirokazu; and Minamino, Kouji, 5,181,160, Cl. 363-97.000.
Yamamoto, Osamu; and Kawanishi, Hidenori, 5,180,685, Cl. 437-129.000.
Yamauchi, Yoshimitsu; Tanaka, Kenichi; Sakiyama, Keizo; and Fukumoto, Katsumi, 5,181,188, Cl. 365-228.000.

Sharpe, Tom G.; Styers, C. James; and Suiter, James M., to Rockwell International Corporation. 3D stereo integrated attitude director and horizontal situation indicator apparatus. 5,181,028, Cl. 340-974.000.

Shaw, James E., to Phillips Petroleum Company. Preparation of bis(organothio) alkanes. 5,180,852, Cl. 568-57.000.

Sheats, James R., to Hewlett-Packard Company. Chemical compositions for improving photolithographic performance. 5,180,655, Cl. 430-327.000.

Sheehan, John P.: *See*—
Schmidt, Glenn H.; Sheehan, John P.; and Helmstetter, Richard C., 5,180,166, Cl. 273-167.00F.

Sheets, Gerald R.: *See*—
Wintersteen, Douglas C.; Hamilton, Lynn R.; Mikesell, Donald E.; and Sheets, Gerald R., 5,179,780, Cl. 29-890.070.

Shell Oil Company: *See*—
Braams, Johannes F. H.; and Reynhout, Marinus J., 5,180,483, Cl. 208-28.000.
Moureaux, Patrick; and Darnanville, Jean P., 5,180,701, Cl. 502-64.000.
Sjardijn, Willem; and Snel, Johannes J. M., 5,180,867, Cl. 585-22.000.

Shelton, Russell S. Measuring apparatus with temperature control. 5,179,786, Cl. 33-503.000.

Shepard, Howard M.; Barkan, Edward D.; and Swartz, Jerome, to Symbol Technologies, Inc. Bar code scanner with automatic de-activation of scan upon bar code recognition. 5,180,904, Cl. 235-470.000.

Shepard, Michele E.: *See*—
Matrick, Howard; Shepard, Michele E.; and You, Young S., 5,180,425, Cl. 106-22.00R.

Sherick, Michael T., to Japan Digital Laboratory Co., Ltd. Device for stacking sheets of paper. 5,179,880, Cl. 83-83.000.

Sherwood, Steven D.: *See*—
Peterson, William A.; Elmore, Michael S.; and Sherwood, Steven D., 5,181,159, Cl. 363-89.000.

Shiao, Shin-Jen, to National Science Council. Polymer based self-lubrication composite. 5,180,761, Cl. 523-213.000.

Shiba, Haruo: *See*—
Tanaka, Kimio; Sato, Shinichi; Satoh, Takateru; and Shiba, Haruo, 5,180,118, Cl. 242-199.000.

Shibata, Yoshihiro: *See*—
Katohno, Nobuo; and Shibata, Yoshihiro, 5,190,117, Cl. 242-189.000.

Shibata, Yoshitaka: *See*—
Aiga, Masayuki; and Shibata, Yoshitaka, 5,180,946, Cl. 315-39.510.

Shibazaki, Osamu: *See*—
Kato, Toshio; Miyazawa, Yorikatu; Shibazaki, Osamu; and Goda, Yoshihiko, 5,179,855, Cl. 72-401.000.

Shibuya Kogyo Co., Ltd.: *See*—
Inoue, Katsuki, 5,180,355, Cl. 493-315.000.

Shields, James P.; and Adamic, Raymond J., to Hewlett-Packard Company. Bleed alleviation using pH-sensitive dyes. 5,181,045, Cl. 346-1.100.

Shiga, Nobuo, to Sumitomo Electric Industries, Ltd. High frequency oscillator having capacitor and microstrip line output filter. 5,180,996, Cl. 331-77.000.

Shigemasa, Takashi: *See*—
Oaki, Junji; Adachi, Shuichi; Iino, Yutaka; and Shigemasa, Takashi, 5,180,956, Cl. 318-568.110.

Shigeno, Yoshiharu; Murata, Michihiro; and Nishino, Yu, to Murata Mfg. Co., Ltd. Magnetic detecting unit having aligned sensors. 5,180,903, Cl. 235-449.000.

Shih, Chin-Tai. Muffler for exhaust gases of a diesel engine. 5,180,406, Cl. 55-232.000.

Shikoku Kakoki Co., Ltd.: *See*—
Wakabayashi, Shigeru; Hirose, Shoji; Nishioka, Shoji; and Fujikawa, Yasuji, 5,180,356, Cl. 493-316.000.

Shim, Dae-Yoon; and Lim, Jong-Sang, to Samsung Electronics Co., Ltd. Apparatus for multiplying real-time 2's complement code in a digital signal processing system and a method for the same. 5,181,184, Cl. 364-758.000.

Shimada, Yasuhiro: *See*—
Nakamura, Morio; Yamamoto, Takushi; Tanaka, Hitoshi; Ozawa, Hitoshi; and Shimada, Yasuhiro, 5,180,798, Cl. 526-66.000.

Shimamune, Takayuki: *See*—
Nishiki, Yoshinori; Sawamoto, Isao; Nakamatsu, Shuji; and Shimamune, Takayuki, 5,180,502, Cl. 210-748.000.

Shimatani, Kazuo: *See*—
Shimatani, Sumie; and Shimatani, Kazuo, 5,180,059, Cl. 206-440.000.

Shimatani, Sumie; and Shimatani, Kazuo. Package of sanitary tampon. 5,180,059, Cl. 206-440.000.

Shimazaki, Hiroshi: *See*—
Fukazawa, Fumie; Irie, Yasushi; Shimazaki, Hiroshi; Yabuuchi, Katuya; and Shimba, Satoru, 5,180,657, Cl. 430-503.000.

Shimba, Satoru: *See*—
Fukazawa, Fumie; Irie, Yasushi; Shimazaki, Hiroshi; Yabuuchi, Katuya; and Shimba, Satoru, 5,180,657, Cl. 430-503.000.

Shimizu Construction Co., Ltd.: *See*—
Yamaguchi, Makoto; Hake, John; Okamura, Kazuo; and Minami, Kiyoshi, 5,180,494, Cl. 210-603.000.

Shimizu, Jamie A., to Oak Tree Packaging Corporation. Wraparound carton lock. 5,180,100, Cl. 229-198.200.

Shimizu, Kazuo: *See*—
Kimura, Tadao; Takahashi, Toshihide; and Shimizu, Kazuo, 5,180,791, Cl. 525-358.000.

Shimizu, Naoya: *See*—
Tsuchimoto, Yoshihiro; Ikezawa, Toshikazu; Morihiro, Naoki; and Shimizu, Naoya, 5,180,412, Cl. 65-66.000.

Shimizu, Sakayu: *See*—
Shinmen, Yoshifumi; Akimoto, Kengo; Asami, Sumio; Suwa, Yoshihide; Kitagawa, Yoshinori; Sugano, Michihiro; Yamada, Hideaki; and Shimizu, Sakayu, 5,180,588, Cl. 424-439.000.

Shimura, Kenichi: *See*—
Ohnishi, Makoto; and Shimura, Kenichi, 5,180,492, Cl. 210-490.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Arai, Masatoshi; Inoue, Yoshifumi; and Inoue, Yoshio, 5,180,771, Cl. 524-588.000.

Shin, Takashi: *See*—
Itoh, Homare; Shin, Takashi; Yajima, Takahisa; and Fukuyasu, Shigeki, 5,180,672, Cl. 435-190.000.

Shin, Teshiki, to Fujitsu Limited. Process for dry etching a silicon nitride layer. 5,180,466, Cl. 156-643.000.

Shinagawa, Shigeo: *See*—
Okabayashi, Makoto; Ishii, Masami; Mita, Juniti; and Shinagawa, Shigeo, 5,180,099, Cl. 228-263.140.

Shindengen Electric Manufacturing Co., Ltd.: *See*—
Nakajima, Satoshi; Mochizuki, Kouichi; Kobayashi, Hiroki; and Kohno, Yuji, 5,181,071, Cl. 355-203.000.

Shindo, Hitoshi; and Nakayama, Jun, to Canon Kabushiki Kaisha. Liquid crystal device and method for producing the same with metal spacer in hole of thin film device's insulator. 5,181,132, Cl. 359-58.000.

Shinmen, Yoshifumi; Akimoto, Kengo; Asami, Sumio; Suwa, Yoshihide; Kitagawa, Yoshinori; Sugano, Michihiro; Yamada, Hideaki; and Shimizu, Sakayu, to Suntory Limited. Liver function improver. 5,180,588, Cl. 424-439.000.

Shinokura, Kiichiro; and Kawaguchi, Hitoshi, to Pioneer Electronic Corporation. Optical pulse generating apparatus. 5,181,213, Cl. 372-30.000.

Shiomi, Kazuyuki; Tanaka, Mitsuharu; Kiku, Kazuomi; and Saito, Akihisa, to Honda Giken Kogyo Kabushiki Kaisha. Joint structure with elastic mount. 5,180,319, Cl. 440-52.000.

Shiomi, Michio: *See*—
Iwata, Satoshi; and Shiomi, Michio, 5,180,670, Cl. 435-119.000.

Shiozaki, Tsugio: *See*—
Kitahara, Satoshi; Koyama, Shuji; and Shiozaki, Tsugio, 5,180,236, Cl. 400-175.000.

Shiozawa, Hideo: *See*—
Ishikawa, Masayuki; Okuda, Hajime; Shiozawa, Hideo; Itaya, Kazuhiko; Watanabe, Yukio; Suzuki, Mariko; and Hatakoshi, Genichi, 5,181,218, Cl. 372-45.000.

Shiraishi, Naomasa: *See*—
Sakakibara, Yasuyuki; Makinouchi, Susumu; Magome, Nobutaka; and Shiraishi, Naomasa, 5,181,067, Cl. 355-43.000.

Shiraishi, Shuji; and Yamamoto, Osamu, to Honda Giken Kogyo Kabushiki Kaisha. Drive wheel slip control system for vehicle. 5,181,175, Cl. 364-426.030.

Shirasaki, Shinichi: *See*—
Terada, Yasuhiko; Abe, Kazunobu; Uno, Hajime; and Shirasaki, Shinichi, 5,180,699, Cl. 501-134.000.

Shirasawa, Hidenori; Tanaka, Yoshiki; and Sawaki, Shinji, to Kabushiki Kaisha Kobe Seiko Sho; and Sango Co. High strength steel pipe for reinforcing door of car. 5,180,204, Cl. 296-146.00C.

Shirazawa, Takashi: *See*—
Murakami, Tadaki; Shirazawa, Takashi; and Kato, Kazuharu, 5,180,532, Cl. 264-60.000.

Shirie, Nobuyuki; and Ohno, Kazunori, to Fuji Photo Optical Co., Ltd. Initial focusing mechanism for zoom lens system. 5,181,144, Cl. 359-700.000.

Shirley, Graham L.: *See*—
Cahill, Michael J.; Patchett, Jeffrey J.; Seaward, David R.; Shirley, Graham L.; and Vernon, Geoffrey W., 5,179,815, Cl. 53-133.300.

Shiromoto, Hiroyoshi: *See*—
Harazoe, Hirofumi; Shiromoto, Hiroyoshi; Yagi, Kazuo; and Kouya, Masahiro, 5,180,636, Cl. 428-373.000.

Shitara, Masashi: *See*—
Era, Susumu; Matsumoto, Toshio; Kobayashi, Yoshinori; Shitara, Masashi; Hattori, Isamu; and Nomura, Yoshihiro, 5,180,786, Cl. 525-281.000.

Shively, John E.: *See*—
Bailey, Jerome M.; and Shively, John E., 5,180,807, Cl. 530-345.000.

Shizuno, Hisamitsu: *See*—
Chazono, Hirokazu; Honda, Mutsumi; Kisi, Hirosi; Saito, Hirosi; and Shizuno, Hisamitsu, 5,181,157, Cl. 361-321.000.

Shoop, Ralph E. Trailer assembly and method. 5,180,205, Cl. 296-181.000.

Shorr, Leonard M.; Fishler, Theodor M.; Yanay, Shaul; and Rumack, Michael, to Bromine Compounds, Ltd. Flame retardant polymer compositions. 5,180,787, Cl. 525-282.000.

Showa Yakuhin Kako Co., Ltd.: *See*—
Kawashima, Yoshiaki; Iwamoto, Taro; and Tejima, Kikuo, 5,180,522, Cl. 252-311.000.

Shuto, Masamoto, to HSST Corporation. Current collecting apparatus for transport vehicle. 5,180,041, Cl. 191-53.000.

Shutske, Gregory M.: *See*—
Wettlaufer, David G.; Shutske, Gregory M.; and Nemoto, Peter A., 5,180,834, Cl. 548-241.000.

Shuttelift, Inc.: *See*—
Feider, Thomas H., 5,180,070, Cl. 212-218.000.

Shyu, Jia-Ming, to Norm Pacific Automation Corp. Ventilation device adjusted and controlled automatically with movement of human body. 5,180,333, Cl. 454-319.000.

Sickora, Vincent J.: *See*—
Cusack, Timothy M.; Sickora, Vincent J.; and Bender, Robert W., 5,180,749, Cl. 514-726.000.

Sieber, J. D. Wave powered energy generator. 5,179,837, Cl. 60-500.000.

Siegel, William J.; Abbagnaro, Louis A.; and Kantter, William J., to Pace Incorporated. Printed circuit thermocouple arrangements for personnel training and equipment evaluation purposes. 5,180,440, Cl. 136-230.000.

Siegfried, Erwin; and Marti, Peter. Arrangement of prestressing tendons in a pressure tunnel. 5,180,253, Cl. 405-146.000.

Siemens Aktiengesellschaft: *See*—
Brandner, Gerhard; and Wegerer, Tanja, 5,180,610, Cl. 427-64.000.
Cour, Marie M. H.; and Vernieres, Raymond F. J., 5,179,928, Cl. 123-606.000.

Siemens Automotive L.P.: *See*—
Johnson, Kenric J., 5,181,004, Cl. 336-198.000.

Siemens Medical Systems, Inc.: *See*—
Purdy, David E., 5,180,981, Cl. 324-309.000.

Siemssen, Siems O.; and Lynnerup, Ole, to Siemssen, Siems Otto. Contractile sleeve element and compression sleeve made therefrom for the peristaltic treatment of extremities. 5,179,941, Cl. 128-40.000.

Siemssen, Siems Otto: *See*—
Siemssen, Siems O.; and Lynnerup, Ole, 5,179,941, Cl. 128-40.000.

Sienkiewicz, Henry: *See*—
Green, David T.; Bolanos, Henry; and Sienkiewicz, Henry, 5,180,373, Cl. 604-167.000.

Siernos, Joseph: *See*—
Cascio, Jack; Ivanov, Konstantin; Alpern, Marvin; Cerwin, Robert; and Siernos, Joseph, 5,180,053, Cl. 206-63.300.

Sigemoto, Hiromi, to Mitsui Petrochemical Industries, Ltd. Composition comprising polymer of 4-methyl-pentene-1. 5,180,768, Cl. 524-420.000.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See*—
Cavazza, Claudio, 5,180,850, Cl. 562-606.000.

Sigworth, Geoffrey K.; and Guzowski, Matthew M., to KB Alloys, Inc. Grain refiner for aluminum containing silicon. 5,180,447, Cl. 148-437.000.

Silberkleit, Lee I.: *See*—
El-Sharkawi, Mohamed A.; Andexler, George; and Silberkleit, Lee I., 5,180,963, Cl. 323-211.000.

Silicon Storage Technology, Inc.: *See*—
Jenq, Ching S., 5,181,187, Cl. 365-182.000.

Simmons, Arlene J. Doll hair maintenance kit apparatus. 5,180,324, Cl. 446-296.000.

Simms, Tammy J.; and Whiting, Frederick J., to Rockwell International Corporation. Rotary ink valve assembly for controlling ink or printing fluid input in a printing press. 5,179,978, Cl. 137-625.460.

Simo, Miroslav A. Arrow rest with forward and backward deflectable arrow support arm. 5,179,930, Cl. 124-44.500.

Simon, Georges H.; Pichot, Patrice J.; and Boissau, Alain J. M., to Giat Industries. Ammunition supply device for an automatic weapon. 5,180,879, Cl. 89-33.170.

Simons, Stephen P.: *See*—
Carlson, Douglas W.; and Simons, Stephen P., 5,180,137, Cl. 251-1.300.

Simpson, Leslie J.; and Bayliss, Brian S. Convertible aircraft seat. 5,180,120, Cl. 244-118.600.

Sims, John E.: *See*—
Dower, Steven K.; March, Carl J.; Sims, John E.; and Urdal, David L., 5,180,812, Cl. 530-351.000.

Sin, Yun-seung, to Samsung Electronics Co., Ltd. Signal delay circuit having specified transistor threshold levels. 5,180,938, Cl. 307-605.000.

Sinclair, Richard G., to BioPak Technology, Ltd. Biodegradable packaging thermoplastics from lactides. 5,180,765, Cl. 524-306.000.

Singer, Joachim; and Singer, Jurgen. Process to destroy bacteria. 5,180,553, Cl. 422-28.000.

Singer, Jurgen: *See*—
Singer, Joachim; and Singer, Jurgen, 5,180,553, Cl. 422-28.000.

Sipido, Victor: *See*—
Freyne, Eddy J. E.; Raeymaekers, Alfons H. M.; Sipido, Victor; and Venet, Marc G., 5,180,832, Cl. 546-333.000.

Sirois, Louis L.: *See*—
Stefanski, Marek J.; Stefanski, Maria; and Sirois, Louis L., 5,180,505, Cl. 210-771.000.

Sitkovsky, Michail V., to United States of America, Health and Human Services. Cytotoxic T lymphocyte activation assay. 5,180,662, Cl. 435-7.240.

Sjardijn, Willem; and Snel, Johannes J. M., to Shell Oil Company. Copolymerization of dicyclopentadiene with norbornene derivatives. 5,180,867, Cl. 585-22.000.

Skarstad, Paul M.: *See*—
Weiss, Douglas J.; Cretzmeyer, John W.; Crespi, Ann M.; Howard, William G.; and Skarstad, Paul M., 5,180,642, Cl. 429-90.000.

Skatulla, Luzian; Vollmer, Hans-Jurgen; and Schneider, Hans-Christoph, to Krupp Koppers GmbH. Method of separation of aromates by extractive distillation. 5,180,474, Cl. 203-84.000.

Skeie, Einar; and Bar-Shalom, Daniel. Anastomotic device. 5,180,392, Cl. 623-11.000.

SKF Industrial Trading & Development Co.: *See*—
Blond, Alejandro; Poll, Gerhard; and Tadic, Vedran, 5,180,980, Cl. 324-229.000.

Skinner, James W., to Press-Seal Gasket Corporation. Method of installing a ribbed sleeve gasket adapter. 5,180,196, Cl. 285-253.000.

Skripek, Michael R., to Sequoia Semiconductor, Inc. Power-on reset architecture. 5,180,926, Cl. 307-272.300.

Smaby, Paul W. Tree or vertical support stand. 5,180,030, Cl. 182-187.000.

Smentek, Thomas J., to B&W Fuel Company. Fuel rod consolidation structure. 5,180,540, Cl. 376-261.000.

Smith, Daniel S. Gardener's aid for sloped ground. 5,180,031, Cl. 182-194.000.

Smith, Darrel L.; and Knight, Donnie. Wiper attachment for rear view mirrors. 5,179,758, Cl. 15-250.003.

Smith, Lawrence C., to Perfectionist Audio Components Inc. Digital interference filter for audio systems. 5,181,000, Cl. 333-181.000.

Smith & Nephew p.l.c.: *See*—
Milner, Richard, 5,180,605, Cl. 427-2.000.

Smith, Paul; and Wittmann, Jean C., to University of California, The Regents of the. Deposition of highly-oriented PTFE films and uses therefor. 5,180,470, Cl. 156-600.000.

Smith, Raymond D.; and Reckers, Janet A., to Chesapeake Display and Packaging Company. Display tray. 5,180,052, Cl. 206-45.110.

Smith, Richard: *See*—
Dillner, Joakim; Lerner, Richard A.; Smith, Richard; and Parks, D. Elliot, 5,180,806, Cl. 530-326.000.

Smith, Robert M.; Ting, David M. T.; Boer, Jan H.; and Mendelssohn, Marvin, to Eastman Kodak Company. Document management and production system. 5,181,162, Cl. 364-419.000.

Smith, Steven W., to IRT Corporation. X-ray backscatter detection system. 5,181,234, Cl. 378-87.000.

Smith, Terrance P.; Macomber, David W.; Chang, Jeffrey C.; and Williams, Linda K., to Minnesota Mining and Manufacturing Company. Transfer imaging using metal-azo and metal-azomethine dyes. 5,180,705, Cl. 503-227.000.

Smiths Industries Public Limited Company: *See*—
John, Laurence N.; and Corner, Neil A., 5,180,227, Cl. 374-131.000.

Smolensky, Leo A.; and Wysk, S. Ronald, to LSR Environmental Systems Company. Potential flow centrifugal separator system for removing solid particulates from a fluid stream. 5,180,486, Cl. 210-195.100.

Snavely, Dan A.: *See*—
Dierenbach, Karl; Jacoby, Elliot G., Jr.; Snavely, Dan A.; Tucker, Darryl W.; Walck, Scott N.; and Walck, Scott N., 5,180,886, Cl. 174-66.000.

Sneed, William. Wireline delivery tool. 5,180,009, Cl. 166-155.000.

Snel, Johannes J. M.: *See*—
Sjardijn, Willem; and Snel, Johannes J. M., 5,180,867, Cl. 585-22.000.

Snyder, James J., to University of California. Microoptic lenses. 5,181,224, Cl. 372-101.000.

Snyderman, Fredric, to CSA, Inc. Hydraulic resistive apparatus for exercise equipment. 5,180,353, Cl. 482-111.000.

Soeder, Bernhard: *See*—
Heinemann, Michael; Soeder, Bernhard; and Meier, Wolfgang, 5,180,948, Cl. 315-111.210.

Soejima, Hideo: *See*—
Takeuchi, Yasuo; Fujii, Mutsuo; and Soejima, Hideo, 5,180,617, Cl. 428-71.000.

Sogabe, Manabu: *See*—
Fujihisa, Hiroaki; and Sogabe, Manabu, 5,181,001, Cl. 335-14.000.

Sogawa, Hiroyuki: *See*—
Inanaga, Kiyofumi; Iida, Yashuhiro; Sogawa, Hiroyuki; and Yabe, Susumu, 5,181,248, Cl. 381-25.000.
Sokolowski, Janusz: *See*—
Sasaki, Kenichi; and Sokolowski, Janusz, 5,179,845, Cl. 62-515.000.
Sollac: *See*—
Grand, Jean-Paul; Juvigny, Daniel; Vinuesa, Andre ; and Tortosa, Serge, 5,180,537, Cl. 266-45.000.
Sollinger, Hans-Peter, to J.M. Voith GmbH. Device for dosing coating substances on a traveling web of paper or cardboard or the like. 5,179,909, Cl. 118-119.000.
Solosky, Rick M.: *See*—
Frazzini, Ronald M.; and Solosky, Rick M., 5,180,979, Cl. 324-207.180.
Solvay S.A.: *See*—
Lerot, Luc; Legrand, Franz; and Bourjot, Joel, 5,180,693, Cl. 501-12.000.
Sonagere, Henry. Portable greenhouse. 5,179,798, Cl. 47-29.000.
Sonderegger, Hans; Kuratle, Rolf; and Wolfer, Peter, to Kistler Instrumente AG. Monitoring system for cyclically operating machines. 5,179,857, Cl. 73-117.300.
Sonnendorfer, Horst; and Wieth, Franz, to SYSTEC Ausbausysteme GmbH. Securing device for carts. 5,180,045, Cl. 194-212.000.
Sonoda, Kazumi: *See*—
Nishizawa, Kanji; Mitsuda, Satoshi; Komaki, Ryohei; Sugimoto, Masako; Sugiki, Chiaki; Ogami, Yasutaka; Sonoda, Kazumi; and Kishimoto, Fumitaka, 5,180,671, Cl. 435-136.000.
Sontag, Sidney. Suturing assembly and method. 5,180,385, Cl. 606-224.000.
Sony Broadcast & Communications Limited: *See*—
Hedley, David J.; and Dorricott, Martin R., 5,181,111, Cl. 358-140.000.
Schiller, Richard F., 5,181,249, Cl. 381-27.000.
Sony Corporation: *See*—
Hiramatsu, Tamihei, 5,180,307, Cl. 434-157.000.
Hirota, Katsuaki; Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; and Kato, Fumiaki, 5,181,119, Cl. 358-227.000.
Inanaga, Kiyofumi; Iida, Yashuhiro; Sogawa, Hiroyuki; and Yabe, Susumu, 5,181,248, Cl. 381-25.000.
Kawakami, Hiroshi, 5,181,125, Cl. 358-336.000.
Koga, Hirohisa, 5,181,146, Cl. 360-19.100.
Kume, Hidehiro; Yamamoto, Etsufumi; and Matsumoto, Yoshiyuki, 5,181,193, Cl. 369-44.230.
Kume, Hidehiro; and Yamamoto, Etsufumi, 5,181,195, Cl. 369-44.410.
Richards, John W.; Pearman, James B.; and Hurley, Terry R., 5,181,114, Cl. 358-146.000.
Sakurai, Hisao; and Nishiyama, Seiichi, 5,180,989, Cl. 330-295.000.
Tatsumi, Tetsuya; and Kadomura, Shingo, 5,180,464, Cl. 156-626.000.
Urayama, Kiyoshi; and Sato, Masanori, 5,180,116, Cl. 242-71.800.
Uryu, Masaru; Tokura, Kunihiko; and Muraoka, Kyouji, 5,180,785, Cl. 525-240.000.
Sony Corporation of America: *See*—
Hodgson, David O., 5,181,100, Cl. 358-37.000.
Sorg Paper Company, The: *See*—
Cessna, Frank L., 5,180,472, Cl. 162-138.000.
Sosin, Laurent: *See*—
Blin, Philippe; Sosin, Laurent; and Loison, Dominique, 5,179,996, Cl. 164-428.000.
Soucie, Wayne L.: *See*—
Arnold, James H.; Perisho, Randal J.; DeWitt, Michael D.; and Soucie, Wayne L., 5,180,038, Cl. 188-171.000.
Southern Audio Services, Inc.: *See*—
Jordan, Jeff B., 5,181,253, Cl. 381-199.000.
Southwell, William H., to Rockwell International Corporation. Multiple line rugate filter with index clipping. 5,181,143, Cl. 359-586.000.
Southwest Research Institute: *See*—
Kwun, Hegeon; Burkhardt, Gary L.; and Fisher, Jay L., 5,180,969, Cl. 324-71.200.
Southwire Company: *See*—
Donath, Steven M., 5,179,830, Cl. 57-305.000.
Sova, Alan, to Weber-Knapp Company. Counterbalance mechanism. 5,180,136, Cl. 248-576.000.
Sowards, Edward W. R. V. toilet venting system. 5,179,738, Cl. 4-213.000.
Sowers, Edward E.: *See*—
McQuigg, Donald W.; and Sowers, Edward E., 5,180,822, Cl. 546-278.000.
Sparks, William O.: *See*—
Saltwick, John M.; Scarinci, Dean; Sparks, William O.; and Gates, Geoffrey W., 5,181,243, Cl. 380-6.000.
Sparrow, James A.; and Cantrell, Robert W., to Westinghouse Electric Corp. Nuclear fuel assembly having double enclosure top nozzle subassembly. 5,180,549, Cl. 376-445.000.
Spector, George: *See*—
Ridge, Ivo B.; and Spector, George, 5,179,824, Cl. 56-202.000.
Spectra-Physics, Incorporated: *See*—
Baer, Thomas M.; and Head, David F., 5,181,223, Cl. 372-69.000.
Spehner, Daniele: *See*—
Drillien, Robert; and Spehner, Daniele, 5,180,675, Cl. 435-235.100.
Spiess, Arthur J.: *See*—
Sufrin, Janice R.; Bacchi, Cyrus J.; Porter, Carl W.; Nathan, Henry; Spiess, Arthur J.; and Yarlett, Nigel, 5,180,714, Cl. 514-46.000.
Spinello, Ronald P., to Spintech, Inc. Hypodermic anesthetic injection apparatus and method. 5,180,371, Cl. 604-118.000.
Spinner, Erwin: *See*—
Henke, Jurgen; Spinner, Erwin; and Fruh, Peter, 5,179,927, Cl. 123-549.000.
Spintech, Inc.: *See*—
Spinello, Ronald P., 5,180,371, Cl. 604-118.000.
Spinti, Mark J.: *See*—
Lund, Gary K.; Spinti, Mark J.; and Doll, Daniel W., 5,180,452, Cl. 149-19.900.
Spitzer, J. George: *See*—
Osipow, Lloyd I.; Marra, Dorothea C.; and Spitzer, J. George, 5,180,753, Cl. 521-65.000.
Spratte, Hans H.; and Pepperl, Rudiger, to Leuze Electronic GmbH & Co. Light barrier with retroreflector and optical means. 5,180,910, Cl. 250-221.000.
Sprinkel, F. Murphy: *See*—
Losee, D. Bruce; Morgan, Constance H.; Sprinkel, F. Murphy; and Utsch, Francis V., 5,179,966, Cl. 131-351.000.
SPS Technologies, Inc.: *See*—
Bogatin, Yakov, 5,180,445, Cl. 148-302.000.
Square D Company: *See*—
Cook, Robert G.; Runyan, Daniel J.; Rezac, Willard J.; Edds, Thomas A.; and Bilas, Ronald J., 5,180,051, Cl. 200-400.000.
Sreter, Change. Appliance used in exercising the arms and the legs. 5,180,352, Cl. 482-108.000.
SRI International: *See*—
Avery, Mitchell A.; and Chong, Wesley K. M., 5,180,840, Cl. 549-348.000.
Srinivasan, Nattu V.: *See*—
Fatehi, Mohammad T.; and Srinivasan, Nattu V., 5,181,134, Cl. 359-117.000.
Stables, Nancy J. Fabric match method and set. 5,180,062, Cl. 206-574.000.
Stack, Larry D., to AT&T Bell Laboratories. Quick release latch mechanism for a telephone handset. 5,181,242, Cl. 379-445.000.
Staffel, Thomas; and Adrian, Renate, to Hoechst Aktiengesellschaft. Process for the removal of ammonia from gases. 5,180,566, Cl. 423-238.000.
Stahlecker, Fritz, to One-half to Hans Stahlecker. Spinning machine having a doffing arrangement. 5,179,828, Cl. 57-269.000.
Stamicarbon B.V.: *See*—
Vroomans, Hubertus J., 5,180,788, Cl. 525-285.000.
Stanislaw, Henry, to Cyberonics, Inc. Implanted apparatus having micro processor controlled current and voltage sources with reduced voltage levels when not providing stimulation. 5,179,950, Cl. 128-423.00R.
Stansberry, Warren W.: *See*—
Swartz, Harold L.; Stansberry, Warren W.; Heidel, Jeffrey C.; and Carlson, Bradley D., 5,180,986, Cl. 324-660.000.
Stansbury, Randall R.; and Seitz, Michael R., to Cray Research, Inc. Apparatus for ultrasonic bonding. 5,180,093, Cl. 228-1.100.
Starchem GmbH: *See*—
Heidel, Klaus; Krause, Frank; and Hofmann, Peter, 5,180,800, Cl. 527-300.000.
Starzewski, Karl-Heinz A. O., to Bayer Aktiengesellschaft. Process for the preparation of styrene derivatives extended at the double bond by ethylene and having a double bond remaining in the extension chain formed and new styrene derivatives extended with ethylene. 5,180,872, Cl. 585-435.000.
State of Israel - Ministry of Defence Armament Development Authority: *See*—
Eden, Benjamin, 5,181,145, Cl. 359-859.000.
States, J. Christopher; Hines, Ronald N.; and Novak, Raymond F., to Wayne State University. Method and cell line for testing mutagenicity of a chemical. 5,180,666, Cl. 435-29.000.
Station Eight, Inc.: *See*—
Oleksinski, John A.; and Hedberg, Earl D., 5,181,069, Cl. 355-133.000.
Stauner, Rudolf: *See*—
Hubner, Oskar; and Stauner, Rudolf, 5,179,980, Cl. 139-450.000.
Steels, Gordon: *See*—
Bainbridge, Ross S.; and Steels, Gordon, 5,180,602, Cl. 426-515.000.
Stefanski, Marek J.; Stefanski, Maria; and Sirois, Louis L. Dewatering method. 5,180,505, Cl. 210-771.000.
Stefanski, Maria: *See*—
Stefanski, Marek J.; Stefanski, Maria; and Sirois, Louis L., 5,180,505, Cl. 210-771.000.
Stehr, Michael; and Voges, Heinz-Werner, to Huels Aktiengesellschaft. Polyethers, their production and use. 5,180,856, Cl. 568-617.000.
Steidele, Andreas: *See*—
Hinz, Joachim; Schneid, Josef; Steidele, Andreas; Volz, Karl; and Stotz, Wolf-Gunter, 5,179,894, Cl. 100-163.00A.
Stein, Hans, to Du Pont de Nemours, E. I., and Company. Torque-transmission device. 5,180,115, Cl. 242-56.900.
Stein, Judith: *See*—
Renlund, Gary M.; Lewis, Larry N.; Stein, Judith; and Bracco, Angelo A., 5,180,694, Cl. 501-12.000.
Steiner, Eginhard: *See*—
Pissiotas, Georg; Moser, Hans; Brunner, Hans-Georg; and Steiner, Eginhard, 5,180,418, Cl. 504-193.000.
Steiner, Gerd; Weniger, Rudi; Braun, Rolf; Otterbach, Rainer; Schubert, Erhard; and Hofmann, Ralf, to MAN Roland Druckmaschinen AG. Method and apparatus for determining register differences from a multi-color printed image. 5,181,257, Cl. 382-17.000.
Steinman, Martin: *See*—
Gala, Dinesh; Steinman, Martin; and Ganguly, Ashit, 5,180,823, Cl. 544-212.000.

StereoGraphics Corporation: *See*—
Lipton, Lenny, 5,181,133, Cl. 359-84.000.
Sterling Winthrop, Inc.: *See*—
Cusack, Timothy M.; Sickora, Vincent J.; and Bender, Robert W., 5,180,749, Cl. 514-726.000.
Stern, Richard A.; and Babbitt, Richard W., to United States of America, Army. Microstrip high reverse loss isolator. 5,180,997, Cl. 333-24.200.
Stern, Theodore G.: *See*—
Cornwall, Mickey; Peterson, David M.; and Stern, Theodore G., 5,180,441, Cl. 136-246.000.
Stevens, Eric S.: *See*—
Marshall, Roger N.; Hauck, Lane T.; Shapiro, Leonid; Busch, Jeffrey W.; and Stevens, Eric S., 5,181,015, Cl. 340-706.000.
Stevenson, Jim. Chemical mixing and delivery system. 5,179,975, Cl. 137-565.000.
Stewart, Robert B.: *See*—
Kung, Robert T. V.; and Stewart, Robert B., 5,180,378, Cl. 606-10.000.
Stine, Alan C.: *See*—
Reynolds, Joseph D.; and Stine, Alan C., 5,179,866, Cl. 74-332.000.
Stine, Laurence O.: *See*—
Frame, Robert R.; Bricker, Jeffery C.; Stine, Laurence O.; and Verachtert, Thomas A., 5,180,484, Cl. 208-189.000.
Stinski, Mark F., to University of Iowa Research Foundation. Early envelope glycoprotein of human cytomegalovirus (HMCV) and monoclonal antibodies to the glycoproteins. 5,180,813, Cl. 530-388.300.
Stokes, Barry O.; Bradshaw, Gary D.; and Barlow, Wayne K., to Wescor, Inc. Apparatus for applying a controlled amount of reagent to a microscope slide or the like. 5,180,606, Cl. 427-2.000.
Stone, Edward; and Wasyliw, Basil, to BASF Corporation. Compatible polyamide-acrylic compositions. 5,180,782, Cl. 525-183.000.
Stone, Julian: *See*—
Chung, Yun C.; DiGiovanni, David J.; Stone, Julian; Sulhoff, James W.; and Zyskind, John L., 5,181,210, Cl. 372-6.000.
Stork Brabant B.V.: *See*—
Liebregts, Paulus M. M., 5,179,897, Cl. 101-129.000.
Stotz, Wolf-Gunter: *See*—
Hinz, Joachim; Schneid, Josef; Steidele, Andreas; Volz, Karl; and Stotz, Wolf-Gunter, 5,179,894, Cl. 100-163.00A.
Stout, Gregg W.; and Matte, James T., to Western Company of North America, The. Multiple acting lock for gravel pack system. 5,180,010, Cl. 166-212.000.
Stradnick, Loran J. Ice scraper apparatus. 5,179,754, Cl. 15-105.000.
Strah, David A.: *See*—
Fuh, Giin-Fa; Morita, Nobuo; Whitfill, Donald L.; and Strah, David A., 5,180,020, Cl. 175-72.000.
Straley, O. James: *See*—
Shafe, Jeff; Straley, O. James; McCarty, Gordon; Oswal, Ravinder K.; and Dharia, Amitkumar N., 5,181,006, Cl. 338-22.00R.
Strandholm, John J.: *See*—
Crane, Lori A.; Hynes, John T.; Guth, Jules H.; and Strandholm, John J., 5,180,604, Cl. 426-582.000.
Stringer, Orum: *See*—
Gaffar, Abdul; Nabi, Nuran; Afflitto, John; and Stringer, Orum, 5,180,578, Cl. 474-52.000.
Strobel, Donald H.; Pridemore, Donald F.; and Gomez, Greg M, to Badger Meter, Inc. Lead line supervision system. 5,181,241, Cl. 379-107.000.
Stroud, Brian T.; Maxwell, Grant D.; and Rohachuk, Ronald E., to COE Manufacturing Company (Canada), Inc., The. Kiln with automatic control of heat distribution. 5,179,789, Cl. 34-54.000.
Stryker Corporation: *See*—
Oberle, Joseph F., 5,179,742, Cl. 5-464.000.
Stucki, Gerhard: *See*—
Thuer, Markus; Stucki, Gerhard; and Boss, Roland, 5,180,495, Cl. 210-605.000.
Studer Revox AG: *See*—
Schultheiss, Roger; and Zwicky, Paul, 5,181,251, Cl. 381-96.000.
Stuhlmiller, Gary: *See*—
Abdi, Behrooz; and Stuhlmiller, Gary, 5,180,935, Cl. 307-524.000.
Stulen, Foster B.: *See*—
Hsieh, Paonan; McComis, William T.; Senapati, Nagabhusan; Stulen, Foster B.; and Paul, Darrell D., 5,180,600, Cl. 426-233.000.
Styan, Paul A.: *See*—
Rigby, Stephen D.; and Styan, Paul A., 5,180,654, Cl. 430-309.000.
Styers, C. James: *See*—
Sharpe, Tom G.; Styers, C. James; and Suiter, James M., 5,181,028, Cl. 340-974.000.
Su, Bean-Horng: *See*—
Yeh, Bean-Shung; Wei, Wu-Yaw; Su, Bean-Horng; and Wu, Lin-Yun, 5,180,025, Cl. 180-65.500.
Sufrin, Janice R.; Bacchi, Cyrus J.; Porter, Carl W.; Nathan, Henry; Spiess, Arthur J.; and Yarlett, Nigel, to Health Research, Inc. Adenosine compounds for the treatment of diseases caused by parasitic protozoa. 5,180,714, Cl. 514-46.000.
Suga, Kaneharu: *See*—
Morita, Yukio; Zushi, Toshihiro; Matsuda, Nobuyoshi; Suga, Kaneharu; and Takai, Takuma, 5,180,754, Cl. 521-85.000.
Sugano, Michihiro: *See*—
Shinmen, Yoshifumi; Akimoto, Kengo; Asami, Sumio; Suwa, Yoshihide; Kitagawa, Yoshinori; Sugano, Michihiro; Yamada, Hideaki; and Shimizu, Sakayu, 5,180,588, Cl. 424-439.000.
Sugawara, Michinori; and Takahashi, Hiroyuki, to NEC Corporation. Current mirror type constant current source circuit having less dependence upon supplied voltage. 5,180,966, Cl. 323-308.000.
Sugawara, Yasuhide: *See*—
Ogata, Masatsugu; Sugawara, Yasuhide; Segawa, Masanori; Abe, Hidetoshi; and Horie, Osamu, 5,181,097, Cl. 257-788.000.
Sugaya, Yoshio; Terada, Ichiro; Sanekata, Kiyonari; and Horie, Hirofumi, to Asahi Glass Company Ltd. Anion exchanger. 5,180,750, Cl. 521-32.000.
Sugie, Masayuki: *See*—
Moriya, Iwao; Sugie, Masayuki; Iwasaki, Masayoshi; and Sakata, Junichiro, 5,180,603, Cl. 426-556.000.
Sugie, Noboru; Furukawa, Kenichi; Ogawa, Makoto; Kurisu, Hironori; Mitsui, Tomonori; Aito, Akio; Nakamura, Mitsunori; and Mochizuki, Hiroshi, to Mitsumi Electric Co., Ltd. Optical disk driver and operational processing apparatus having such optical disk driver. 5,181,197, Cl. 369-75.100.
Sugihara, Yasuo; Komatsu, Toshio; Kashiba, Takashi; Hatakeyama, Hidetoshi; and Takeuchi, Teruo, to Mitsubishi Gas Chemical Co., Inc. Oxygen absorbent. 5,180,518, Cl. 252-188.280.
Sugiki, Chiaki: *See*—
Nishizawa, Kanji; Mitsuda, Satoshi; Komaki, Ryohei; Sugimoto, Masako; Sugiki, Chiaki; Ogami, Yasutaka; Sonoda, Kazumi; and Kishimoto, Fumitaka, 5,180,671, Cl. 435-136.000.
Sugimoto, Kenji; and Fujita, Mitsuhiro, to Dainippon Screen Mfg. Co., Ltd. Apparatus for applying liquid agent on surface of rotating substrate. 5,180,431, Cl. 118-52.000.
Sugimoto, Masako: *See*—
Nishizawa, Kanji; Mitsuda, Satoshi; Komaki, Ryohei; Sugimoto, Masako; Sugiki, Chiaki; Ogami, Yasutaka; Sonoda, Kazumi; and Kishimoto, Fumitaka, 5,180,671, Cl. 435-136.000.
Sugimoto, Nobuji: *See*—
Terada, Masahiro; Sugimoto, Nobuji; Watanabe, Toshiro; and Sugimoto, Takashi, 5,180,629, Cl. 428-220.000.
Sugimoto, Takashi: *See*—
Terada, Masahiro; Sugimoto, Nobuji; Watanabe, Toshiro; and Sugimoto, Takashi, 5,180,629, Cl. 428-220.000.
Sugishima, Kiyohisa; and Nishio, Masahiro, to Canon Kabushiki Kaisha. Image processing apparatus having a reader movable to a designated position. 5,181,104, Cl. 358-75.000.
Sugiura, Hiroyuki: *See*—
Ono, Katsuhiro; Anno, Hidero; Sugiura, Hiroyuki; and Kitami, Takayuki, 5,181,235, Cl. 378-133.000.
Sugiyama, Hiroyuki: *See*—
Yamaoka, Fumiyuki; Sasaki, Mitsuo; Nakazawa, Chiharu; and Sugiyama, Hiroyuki, 5,180,129, Cl. 248-230.000.
Sugiyama, Ikuo; Ishibashi, Kazuhisa; Takakusaki, Nobuyuki; Maruhashi, Yoshitsugu; Nishimura, Yasushi; Koyama, Hiroshi; Iida, Setsuko; and Sato, Koji, to Toyo Seikan Kaisha Ltd. Method of heating thermoplastic bottle or preform and method of controlling temperature of heating member utilized by the heating method. 5,180,893, Cl. 219-10.430.
Sugiyama, Kazuhiro; and Atsumi, Yoshinori, to Casio Computer Co., Ltd. Conductive bonding agent and a conductive connecting method. 5,180,888, Cl. 174-94.00R.
Sugiyama, Masato: *See*—
Katsumata, Kenji; Hirahata, Shigeru; Sugiyama, Masato; Matono, Takaaki; Ishikura, Kazuo; Suzuki, Sunao; and Kaizaki, Kazuhiro, 5,181,110, Cl. 358-140.000.
Sugiyama, Takeshi, to Mitsubishi Denki K.K. Electromagnetic switch for starter. 5,181,002, Cl. 335-131.000.
Suh, Sung S.: *See*—
Ha, Jae M.; Jeong, Kwang L.; and Suh, Sung S., 5,180,575, Cl. 404-49.000.
Suhan, John M., to WEA Manufacturing, Inc. Print scanner. 5,181,081, Cl. 356-394.000.
Suiter, James M.: *See*—
Sharpe, Tom G.; Styers, C. James; and Suiter, James M., 5,181,028, Cl. 340-974.000.
Sukeyasu, Ryuzo; Kishina, Yoshiyuki; Okawa, Masao; Horigome, Naoyuki; and Ito, Yasuhito, to Sumitomo Bakelite Company, Ltd.; and Sumitomo Heavy Industries, Ltd. Methods of preparation of packaging bags for bottles, methods of preparation of packaging bottles and apparatus utilized therefor. 5,179,819, Cl. 53-442.000.
Sulhoff, James W.: *See*—
Chung, Yun C.; DiGiovanni, David J.; Stone, Julian; Sulhoff, James W.; and Zyskind, John L., 5,181,210, Cl. 372-6.000.
Sulzer Brothers Limited: *See*—
Hubner, Oskar; and Stauner, Rudolf, 5,179,980, Cl. 139-450.000.
Zollinger, Hans, 5,179,979, Cl. 139-449.000.
Sulzer Escher Wyss GmbH: *See*—
Hinz, Joachim; Schneid, Josef; Steidele, Andreas; Volz, Karl; and Stotz, Wolf-Gunter, 5,179,894, Cl. 100-163.00A.
Suman, Michael J.; Reed, Stewart D.; Frye, Dale J.; and Clark, Russell L., to Prince Corporation. Universal vehicle accessory mounting system. 5,180,089, Cl. 224-42.45R.
Sumii, Masaaki, to Sakura Color Products Corporation. Double-walled microcapsules and a process for preparation of same. 5,180,637, Cl. 428-402.210.
Sumikawa, Takeshi: *See*—
Furuya, Nobumasa; Noami, Tsuneo; and Sumikawa, Takeshi, 5,181,072, Cl. 355-225.000.
Sumita, Masaya, to Asahi Kogaku Kogyo K.K. Composition for forming calcium phosphate type setting material and process for producing setting material. 5,180,426, Cl. 106-35.000.

Sumitomo Bakelite Company Company Limited: *See*—
Idemoto, Morito; Inoue, Naohiko; and Noguchi, Yasuo, 5,180,363, Cl. 202-32.000.
Sumitomo Bakelite Company, Ltd.: *See*—
Sukeyasu, Ryuzo; Kishina, Yoshiyuki; Okawa, Masao; Horigome, Naoyuki; and Ito, Yasuhito, 5,179,819, Cl. 53-442.000.
Sumitomo Chemical Company, Limited: *See*—
Abe, Hiroomi; Fujii, Takeshi; and Mitsui, Kiyoshi, 5,180,763, Cl. 524-112.000.
Gomi, Hideyuki; Hozumi, Tatsunobu; Hattori, Shizuo; Tagawa, Chiaki; Kishimoto, Fumitaka; and Bjorck, Lars, 5,180,810, Cl. 530-350.000.
Hikasa, Tadashi; Ibuki, Koichiro; Hamanaka, Tatsuo; and Mizumori, Motoo, 5,180,769, Cl. 524-525.000.
Katayama, Yasuyuki; Ishimoto, Yasuhiko; Horide, Fumio; Tsuda, Shigenori; and Nishioka, Fumio, 5,180,420, Cl. 504-116.000.
Nagasaki, Hideo; Inui, Naoki; Yachigo, Shinichi; Abe, Hiroomi; Fujii, Takeshi; and Yamamoto, Masashi, 5,180,764, Cl. 524-260.000.
Nishizawa, Kanji; Mitsuda, Satoshi; Komaki, Ryohei; Sugimoto, Masako; Sugiki, Chiaki; Ogami, Yasutaka; Sonoda, Kazumi; and Kishimoto, Fumitaka, 5,180,671, Cl. 435-136.000.
Ogino, Kazuya; Akahori, Kingo; and Harada, Naoki, 5,180,817, Cl. 534-811.000.
Ohmae, Tadayuki; Toyoshima, Yoshiki; Tanaka, Hisao; Okada, Mitsuyuki; and Fujita, Harunori, 5,180,784, Cl. 525-207.000.
Tomioka, Hiroki; Sakamoto, Noriyasu; Umeda, Kimitoshi; Fujimoto, Hiroaki; Ishiwatari, Takao; and Kisida, Hirosi, 5,180,732, Cl. 514-396.000.
Sumitomo Electric Industries, Ltd.: *See*—
Harada, Keizo; Hattori, Hisao; and Itozaki, Hideo, 5,180,708, Cl. 505-1.000.
Shiga, Nobuo, 5,180,996, Cl. 331-77.000.
Sumitomo Heavy Industries, Ltd.: *See*—
Sukeyasu, Ryuzo; Kishina, Yoshiyuki; Okawa, Masao; Horigome, Naoyuki; and Ito, Yasuhito, 5,179,819, Cl. 53-442.000.
Sumitomo Pharmaceuticals Company, Limited: *See*—
Ozato, Yukinori; Tamura, Nobuhiko; Masumori, Hiroaki; Yamamoto, Michihiro; Kojima, Atsuyuki; Nishikaku, Fumio; and Kimura, Yoshihiko, 5,180,731, Cl. 514-364.000.
Sumitomo Seika Chemicals Co., Ltd.: *See*—
Nakamura, Morio; Yamamoto, Takashi; Tanaka, Hitoshi; Ozawa, Hitoshi; and Shimada, Yasuhi:o, 5,180,798, Cl. 526-66.000.
Sumitomo Special Metals Co., Ltd.: *See*—
Yamashita, Masami; Iwato, Noboru; Mine, Hideki; and Toshiaki, Wada, 5,181,151, Cl. 360-126.000.
Sumitomo Wiring Systems Ltd.: *See*—
Iura, Kazuo; Yamano, Yoshiaki; and Saka, Kazuhito, 5,179,779, Cl. 29-877.000.
Sumner, Roger A.: *See*—
LaVallee, James R.; Hilsenbeck, Jerry M.; Brown, James G.; Sumner, Roger A.; Zazzera, Andre C.; and Bailey, Dana A., 5,181,236, Cl. 379-67.000.
Sun, Gary, to Rockwell International Corporation. Printer with roller mounting assembly. 5,179,898, Cl. 101-148.000.
Sun Microsystems, Inc.: *See*—
Davidson, Howard L.; and Nishtala, Satyanarayana, 5,181,167, Cl. 361-385.000.
Sun Son Aluminum Factory Co., Ltd.: *See*—
Lee, Ching C., 5,180,087, Cl. 224-274.000.
Sundstrand Corporation: *See*—
Lampe, Steven, 5,179,831, Cl. 60-39.142.
Sungberg, Carl B. Plastic paper clip. 5,179,765, Cl. 24-67.900.
Sunshon Molding Co., Ltd.: *See*—
Chiu, Hsiu-Hui, 5,180,184, Cl. 280-646.000.
Suntory Limited: *See*—
Shinmen, Yoshifumi; Akimoto, Kengo; Asami, Sumio; Suwa, Yoshihide; Kitagawa, Yoshinori; Sugano, Michihiro; Yamada, Hideaki; and Shimizu, Sakayu, 5,180,588, Cl. 424-439.000.
Supracor Systems, Inc.: *See*—
Landi, Curtis L.; and Wilson, Susan L., 5,180,619, Cl. 428-116.000.
Sutherland, Joseph E., to Alcatel Network Systems, Inc. Video line shelf arrangement in an optical fiber telecommunications network providing broadband switched video services. 5,181,106, Cl. 358-86.000.
Sutherlin, Dirk M., to Phillips Petroleum Company. Derivatization of arylene sulfide polymers. 5,180,796, Cl. 525-537.000.
Sutter Corporation: *See*—
Donovan, T. L.; and Allemandi, R. J., 5,179,939, Cl. 128-25.00R.
Suwa, Yoshihide: *See*—
Shinmen, Yoshifumi; Akimoto, Kengo; Asami, Sumio; Suwa, Yoshihide; Kitagawa, Yoshinori; Sugano, Michihiro; Yamada, Hideaki; and Shimizu, Sakayu, 5,180,588, Cl. 424-439.000.
Suyama, Motohiro, to Hamamatsu Photonics K.K. Device for deriving a change of time-dependent information by converting the information to positional-dependent information. 5,180,908, Cl. 250-214.0VT.
Suzuki, Akihiro: *See*—
Sato, Yukio; Suzuki, Akihiro; Inoue, Mitsuo; Haruta, Kenyu; and Nagai, Haruhiko, 5,181,217, Cl. 372-38.000.
Suzuki, Fujio: *See*—
Maeda, Hiroshi; Suzuki, Fujio; and Oda, Tatsuya, 5,180,582, Cl. 424-94.400.
Suzuki, Mariko: *See*—
Ishikawa, Masayuki; Okuda, Hajime; Shiozawa, Hideo; Itaya, Kazuhiko; Watanabe, Yukio; Suzuki, Mariko; and Hatakoshi, Genichi, 5,181,218, Cl. 372-45.000.
Suzuki Motor Corporation: *See*—
Toyoda, Nubuo, 5,180,206, Cl. 296-204.000.
Suzuki, Naoki: *See*—
Ueda, Tetsuya; Suzuki, Naoki; and Yano, Kohsaku, 5,180,436, Cl. 118-723.000.
Suzuki, Sunao: *See*—
Katsumata, Kenji; Hirahata, Shigeru; Sugiyama, Masato; Matono, Takaaki; Ishikura, Kazuo; Suzuki, Sunao; and Kaizaki, Kazuhiro, 5,181,110, Cl. 358-140.000.
Suzuki, Tokio: *See*—
Sato, Koji; Suzuki, Tokio; Kamiya, Hajime; Nakamura, Kimio; Kosaka, Masahisa; and Ohsora, Tetsuo, 5,181,141, Cl. 359-580.000.
Suzuki, Toshio: *See*—
Takaku, Akira; Hashimoto, Toshimasa; Suzuki, Toshio; Takahashi, Yutaka; and Saito, Kazuo, 5,180,529, Cl. 264-29.600.
Suzuki, Toshiya, to NEC Corporation. Method of making multilayer printed wiring boards. 5,179,777, Cl. 29-848.000.
Svehaug, Oswald C. Tail light cover. 5,180,224, Cl. 362-255.000.
Swain, James C.; and Wilcox, John P., to General Motors Corporation. Scroll compressor Oldham coupling having anti-friction means. 5,180,295, Cl. 418-55.300.
Swank, Harry R., to Thomson Consumer Electronics, Inc. Cathode-ray tube having a shrinkfit implosion protection band with tension limiting means. 5,181,123, Cl. 358-246.000.
Swanson, Glenn E.: *See*—
Haley, William J.; and Swanson, Glenn E., 5,180,339, Cl. 474-28.000.
Swart, Mark A.: *See*—
Van Loan, David R.; Johnston, Charles J.; and Swart, Mark A., 5,180,976, Cl. 324-158.00F.
Swartz, Harold L.; Stansberry, Warren W.; Heidel, Jeffrey C.; and Carlson, Bradley D., to Schaevitz Sensing Systems, Inc. Two axis capacitive inclination sensor. 5,180,986, Cl. 324-660.000.
Swartz, Jerome: *See*—
Shepard, Howard M.; Barkan, Edward D.; and Swartz, Jerome, 5,180,904, Cl. 235-470.000.
Swerve Systems, Inc.: *See*—
Barreiro, Armando, 5,179,940, Cl. 128-33.000.
Swilling, William H., Jr.: *See*—
Piccolo, Joseph R., Sr.; Swilling, William H., Jr.; Kearney, Michael R.; and Mosher, Douglas E., 5,180,225, Cl. 366-147.000.
Symbol Technologies, Inc.: *See*—
Shepard, Howard M.; Barkan, Edward D.; and Swartz, Jerome, 5,180,904, Cl. 235-470.000.
Synnett, Karen P.: *See*—
Helit, Thomas M.; Lowell, Kenneth W.; and Synnett, Karen P., 5,180,157, Cl. 271-256.000.
Syntellect, Inc.: *See*—
Saltwick, John M.; Scarinci, Dean; Sparks, William O.; and Gates, Geoffrey W., 5,181,243, Cl. 380-6.000.
Synthes (U.S.A.): *See*—
Frigg, Robert; Perren, Stephan; Allgower, Martin; and Gisin, Paul, 5,180,382, Cl. 606-65.000.
Synthopol Chemie Dr. rer. pol. Koch GmbH & Co., KG: *See*—
Dalibor, Horst, 5,180,773, Cl. 524-853.000.
SYSTEC Ausbausysteme GmbH: *See*—
Sonnendorfer, Horst; and Wieth, Franz, 5,180,045, Cl. 194-212.000.
Szoka, Francis C.: *See*—
Abra, Robert; and Szoka, Francis C., 5,180,713, Cl. 514-31.000.
T. Sendzimir, Inc.: *See*—
Turley, John W.; and Sendzimir, Michael G., 5,179,851, Cl. 72-7.000.
Tabata, Yasushi: *See*—
Kobayshi, Takeo; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, 5,181,060, Cl. 354-238.100.
Tadic, Vedran: *See*—
Blond, Alejandro; Poll, Gerhard; and Tadic, Vedran, 5,180,980, Cl. 324-229.000.
Tagami, Shigeru; Akimoto, Kazuo; Ito, Kanji; and Matsushita, Katsuhiko, to Seikosha Co., Ltd. Camera shutter. 5,181,063, Cl. 354-435.000.
Tagami, Shigeru; Akimoto, Kazuo; Matsushita, Katsuhiko; and Ito, Kanji, to Seikosha Co., Ltd. Camera shutter. 5,181,064, Cl 354-437.000.
Tagawa, Chiaki: *See*—
Gomi, Hideyuki; Hozumi, Tatsunobu; Hattori, Shizuo; Tagawa, Chiaki; Kishimoto, Fumitaka; and Bjorck, Lars, 5,180,810, Cl. 530-350.000.
Tai, Eva F.; Hull, John W., Jr.; and First, Kenneth E., to DowElanco. Regeneration and extension of lifetime of dehydrogenation catalysts used in the preparation of 2-alkylpyrimidines. 5,180,700, Cl. 502-50.000.
Taiwan Semiconductor Manufacturing Company: *See*—
Liu, Hsien-Tsung; Lee, Jin-Yuan; Wang, Jiann-Kwang; Yoo, Chue-San; and Wang, Pei-Jan, 5,180,689, Cl. 437-228.000.
Taiyo Yuden Kabusikigaisha: *See*—
Chazono, Hirokazu; Honda, Mutsumi; Kisi, Hirosi; Saito, Hirosi; and Shizuno, Hisamitsu, 5,181,157, Cl. 361-321.000.
Tajima, Minoru: *See*—
Inoue, Masato; Tajima, Minoru; Orime, Nobutake; and Katagi, Takashi, 5,181,040, Cl. 342-149.000.
Tajima, Susumu: *See*—
Ueta, Koki; Kamada, Naoki; Mori, Hideo; Endo, Suehiro; and Tajima, Susumu, 5,179,864, Cl. 74-7.00A.

Takabayashi, Seiichirou: *See*—
Inoue, Hiroshi; Takabayashi, Seiichirou; Muramatsu, Tadao; Funagoshi, Tsutomu; and Hirano, Tetsuji, 5,180,627, Cl. 428-214.000.

Takada, Shun: *See*—
Murai, Kazuhiro; and Takada, Shun, 5,180,659, Cl. 430-623.000.

Takada, Tetuzi; and Gotoh, Nobuo, to Koei Chemical Co., Ltd. Aminecured epoxy resin with phenoxyethyl (meth) acrylates. 5,180,792, Cl. 525-423.000.

Takagi, Junichi; and Hirasaki, Norio, to Fuji Photo Film Co., Ltd. Lens-fitted photographic film package. 5,181,057, Cl. 354-94.000.

Takahashi, Arihiro: *See*—
Harada, Chikao; Kawamura, Norio; Nakashima, Ryuji; Takahashi, Arihiro; Yamazaki, Toshimasa; Yasui, Masanobu; and Kondo, Tatsuhi, 5,179,956, Cl. 128-672.000.

Takahashi, Hiroyuki: *See*—
Kawasaki, Masahiro; Takahashi, Hiroyuki; and Iwamoto, Shigeru, 5,181,061, Cl. 354-400.000.
Sugawara, Michinori; and Takahashi, Hiroyuki, 5,180,966, Cl. 323-308.000.

Takahashi, Takashi; and Takehira, Yoshikazu, to Daiso Co., Ltd. Optically active 2-methylenecyclopentanone derivative and process for preparing same. 5,180,844, Cl. 556-436.000.

Takahashi, Toshihide: *See*—
Kimura, Tadao; Takahashi, Toshihide; and Shimizu, Kazuo, 5,180,791, Cl. 525-358.000.

Takahashi, Tsutomu: *See*—
Nakatani, Isao; Ozawa, Kiyosho; Hijikata, Masayuki; and Takahashi, Tsutomu, 5,180,512, Cl. 252-62.510.

Takahashi, Yutaka: *See*—
Takaku, Akira; Hashimoto, Toshimasa; Suzuki, Toshio; Takahashi, Yutaka; and Saito, Kazuo, 5,180,529, Cl. 264-29.600.

Takai, Takuma: *See*—
Morita, Yukio; Zushi, Toshihiro; Matsuda, Nobuyoshi; Suga, Kaneharu; and Takai, Takuma, 5,180,754, Cl. 521-85.000.

Takakarhu, Jouni, to Neste OY. Method and apparatus for taking samples. 5,180,558, Cl. 422-131.000.

Takaki, Shinichi: *See*—
Sakakibara, Shiro; Inuzuka, Takeshi; Hattori, Masashi; Fukatsu, Hironari; and Takaki, Shinichi, 5,179,867, Cl. 74-335.000.

Takaku, Akira; Hashimoto, Toshimasa; Suzuki, Toshio; Takahashi, Yutaka; and Saito, Kazuo, to Nisshinbo Industries, Inc. Process for producing a thin carbon plate. 5,180,529, Cl. 264-29.600.

Takakura, Hiroshi; Yamaguchi, Akira; and Iida, Tetsuya, to Kabushiki Kaishi Toshiba. Digital to analog converter. 5,181,034, Cl. 341-144.000.

Takakusaki, Nobuyuki: *See*—
Sugiyama, Ikuo; Ishibashi, Kazuhisa; Takakusaki, Nobuyuki; Maruhashi, Yoshitsugu; Nishimura, Yasushi; Koyama, Hiroshi; Iida, Setsuko; and Sato, Koji, 5,180,893, Cl. 219-10.430.

Takasago International Corporation: *See*—
Sato, Toshiya; and Hata, Hamako, 5,180,586, Cl. 424-405.000.

Takashima, Sumihiro, to Oki Electric Industry Co., Ltd. Frequency adjustable RC oscillator. 5,180,991, Cl. 331-1.00A.

Takasugi, Hisashi: *See*—
Kato, Masayuki; Nishino, Shigetaka; Ito, Kiyotaka; and Takasugi, Hisashi, 5,180,728, Cl. 514-267.000.

Takata Corporation: *See*—
Kazuo, Yoshimura; and Satoh, Ryo, 5,180,892, Cl. 200-61.45M.

Takatani, Shinichiro: *See*—
Usagawa, Toshiyuki; Imamura, Yoshinori; Okuhira, Hidekazu; Goto, Shigeo; Kobayashi, Masayoshi; and Takatani, Shinichiro, 5,181,087, Cl. 257-194.000.

Takatori, Hiroshi, to Level One Communications, Inc. System and method for phase equalization. 5,181,228, Cl. 375-103.000.

Take, Shigeo, to Oppama Kogyo Kabushiki Kaisha. Diesel engine revolution counter. 5,181,232, Cl. 377-30.000.

Takeda Chemical Industries: *See*—
Kishimoto, Shoji; and Fujita, Takeshi, 5,180,738, Cl. 514-475.000.

Takeda Chemical Industries, Ltd.: *See*—
Goto, Giichi; Nagaoka, Akinobu; and Ishihara, Yuji, 5,180,746, Cl. 514-654.000.
Kishimoto, Shoji; Marui, Shogo; and Fujita, Takeshi, 5,180,735, Cl. 514-443.000.
Terao, Shinji; and Maki, Yoshitaka, 5,180,742, Cl. 514-558.000.
Uneme, Hideki; Higuchi, Noriko; and Minamida, Isao, 5,180,833, Cl. 548-202.000.

Takehana, Sakae: *See*—
Nagayoshi, Mitsugu; Miyazaki, Atsushi; Miyanaga, Hirofumi; Takehana, Sakae; Adachi, Hideyuki; Ueda, Yasuhiro; Fuse, Eiichi; and Aoki, Yoshisada, 5,179,934, Cl. 128-4.000.

Takehira, Yoshikazu: *See*—
Takahashi, Takashi; and Takehira, Yoshikazu, 5,180,844, Cl. 556-436.000.

Takekoshi, Atuhisa: *See*—
Tarumi, Yoshihiko; Takekoshi, Atuhisa; Inaba, Mamoru; Nishi, Yoshiro; Sakurai, Masaaki; Sakamoto, Satoshi; and Sato, Kimihiko, 5,180,228, Cl. 374-139.000.

Takenaka, Mitsuhiko: *See*—
Fukushima, Hirotaka; and Takenaka, Mitsuhiko, 5,180,044, Cl. 192-106.100.

Takeuchi, Masahiro, to Seiko Epson Corporation. Semiconductor device and method of producing semiconductor device. 5,180,682, Cl. 437-44.000.

Takeuchi, Takayuki; and Hirata, Isao, to Nippon Die Steel Co., Ltd.; and Asahi Machinery Ltd. Waste removing apparatus. 5,179,882, Cl. 83-125.000.

Takeuchi, Teruo: *See*—
Sugihara, Yasuo; Komatsu, Toshio; Kashiba, Takashi; Hatakeyama, Hidetoshi; and Takeuchi, Teruo, 5,180,518, Cl. 252-188.280.

Takeuchi, Yasuo; Fujii, Mutsuo; and Soejima, Hideo, to Nishikawa Kaisei Co., Ltd. Interior finishing panel for a vehicle and a method for producing the same. 5,180,617, Cl. 428-71.000.

Takeura, Tooru: *See*—
Katsumata, Masao; Momata, Kazuhiro; Adachi, Kazuyoshi; Takeura, Tooru; Kitada, Masahiro; Kamo, Yoshihisa; and Yoshimatsu, Toshikane, 5,181,149, Cl. 360-119.000.

Takiguchi, Hideo: *See*—
Udagawa, Yoshiro; and Takiguchi, Hideo, 5,181,105, Cl. 358-80.000.

Takiguchi, Tsuyoshi: *See*—
Kukimoto, Tsutomu; Yusa, Hiroshi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; and Kuwashima, Tetsuhito, 5,180,649, Cl. 430-106.600.

Takimoto, Koji: *See*—
Kamoshita, Ryuji; Kashiwagi, Hiroki; and Takimoto, Koji, 5,180,779, Cl. 525-87.000.

Talley, Robert E.: *See*—
Adams, John M.; Chance, Christopher N.; DeBlasio, James A.; Evers, Donald H.; Kirby, Michael A., Sr.; Newsome, Reginald W.; and Talley, Robert E., 5,180,056, Cl. 206-256.000.
Chance, Christopher N.; DeBlasio, James A.; Evers, Donald H.; Harris, William C., Jr.; Kirby, Michael A., Sr.; Newsome, Reginald W.; and Talley, Robert E., 5,180,055, Cl. 206-256.000.

Tamiya, Mitsuru: *See*—
Nakamura, Shuji; and Tamiya, Mitsuru, 5,180,198, Cl. 292-201.000.

Tamura, Nobuhiko: *See*—
Ozato, Yukinori; Tamura, Nobuhiko; Masumori, Hiroaki; Yamamoto, Michihiro; Kojima, Atsuyuki; Nishikaku, Fumio; and Kimura, Yoshihiko, 5,180,731, Cl. 514-364.000.

Tanaka, Hiroshi; and Kobayashi, Ryoji, to Kabushiki Kaisha Konoike Gumi; and Kabushiki Kaisha Komatsu Seisakusho. Earth pressure system shield process. 5,180,252, Cl. 405-144.000.

Tanaka, Hisao: *See*—
Ohmae, Tadayuki; Toyoshima, Yoshiki; Tanaka, Hisao; Okada, Mitsuyuki; and Fujita, Harunori, 5,180,784, Cl. 525-207.000.

Tanaka, Hitoshi: *See*—
Nakamura, Morio; Yamamoto, Takushi; Tanaka, Hitoshi; Ozawa, Hitoshi; and Shimada, Yasuhiro, 5,180,798, Cl. 526-66.000.

Tanaka, Kazuo: *See*—
Hirata, Shinji; and Tanaka, Kazuo, 5,180,953, Cl. 315-241.00S.

Tanaka, Kenichi: *See*—
Yamauchi, Yoshimitsu; Tanaka, Kenichi; Sakiyama, Keizo; and Fukumoto, Katsumi, 5,181,188, Cl. 365-228.000.

Tanaka, Kimio; Sato, Shinichi; Satoh, Takateru; and Shiba, Haruo, to TDK Corporation. Magnetic tape cassettes. 5,180,118, Cl. 242-199.000.

Tanaka, Mitsuharu: *See*—
Shiomi, Kazuyuki; Tanaka, Mitsuharu; Kiku, Kazuomi; and Saito, Akihisa, 5,180,319, Cl. 440-52.000.

Tanaka, Yoshiki: *See*—
Shirasawa, Hidenori; Tanaka, Yoshiki; and Sawaki, Shinji, 5,180,204, Cl. 296-146.00C.

Tanaka, Yoshinori: *See*—
Eimori, Takahisa; Wakamiya, Wataru; Ozaki, Hiroji; Tanaka, Yoshinori; and Satoh, Shinichi, 5,181,094, Cl. 257-372.000.
Wakamiya, Wataru; Tanaka, Yoshinori; Eimori, Takahisa; Ozaki, Hiroji; Kimura, Hiroshi; and Satoh, Shinichi, 5,180,683, Cl. 437-47.000.

Tanaka, Yukio: *See*—
Matsuda, Yoshihisa; Teroaka, Reiko; Tanaka, Yukio; and Abe, Hisato, 5,180,747, Cl. 514-681.000.

Taniguchi, Norio, to Mitsui Petrochemnical Industries, Ltd. Process for producing purified terephthalic acid. 5,180,849, Cl. 562-414.000.

Taniguchi, Tsutomu, to Fuji Seiki Inc. Valve open-close indicating apparatus. 5,179,974, Cl. 137-554.000.

Tanimura, Akira: *See*—
Furukawa, Shinji; Oka, Kazuki; and Tanimura, Akira, 5,181,020, Cl. 340-551.000.

Tapeswitch Corporation of America: *See*—
Lovell, Walter C., 5,180,900, Cl. 219-517.000.

Tarumi, Yoshihiko; Takekoshi, Atuhisa; Inaba, Mamoru; Nishi, Yoshiro; Sakurai, Masaaki; Sakamoto, Satoshi; and Sato, Kimihiko, to Asahi Glass Company Ltd.; and NKK Corporation. Radiation thermometer for molten iron and method for measuring the temperature of molten iron. 5,180,228, Cl. 374-139.000.

Tatsumi, Tetsuya; and Kadomura, Shingo, to Sony Corporation. Dry etching method. 5,180,464, Cl. 156-626.000.

Tatzel, Hermann: *See*—
Haardt, Udo; Seiler, Erhard; Tatzel, Hermann; Schwager, Harald; and Domas, Friedrich, 5,180,628, Cl. 428-215.000.

Taubitz, Christof; Seiler, Erhard; Boehlke, Klaus; and Lausberg, Dietrich, to BASF Aktiengesellschaft. Thermoplastic molding materials based on polyphenylene ethers and polyesters. 5,180,778, Cl. 525-74.000.

Taylor, Robert E. Split stack fire-fighting apparatus and process of use. 5,180,018, Cl. 169-47.000.

Taylor, Timothy E.: *See*—
Aust, Gilbert M.; and Taylor, Timothy E., 5,180,381, Cl. 606-61.000.

TDK Corporation: *See—*
Tanaka, Kimio; Sato, Shinichi; Satoh, Takateru; and Shiba, Haruo, 5,180,118, Cl. 242-199.000.

Teac Corporation: *See—*
Hamada, Toshihiko, 5,181,147, Cl. 360-31.000.

Teague, Dorwin: *See—*
Teague, W. Dorwin, 5,180,105, Cl. 239-14.200.

Teague, W. Dorwin, to Teague, Dorwin. Snow making apparatus. 5,180,105, Cl. 239-14.200.

Teekman, Gertjan A. O., to Aardelite Holding B.V. Method for reducing the leachability of granular material and granular material obtained using this method. 5,180,638, Cl. 428-407.000.

Teichmann, Thorsten; and Allerding, Volker, to Deutsche Airbus GmbH. Apparatus for locking and unlocking a flap door, especially in an aircraft. 5,180,199, Cl. 292-259.000.

Teijin Chemicals, Ltd.: *See—*
Umeda, Kazuyoshi; and Nakamoto, Funiaki, 5,180,525, Cl. 252-609.000.

Teijin Limited: *See—*
Ichikawa, Yataro; Hamamoto, Kimihiko; and Tokashiki, Michiyuki, 5,180,676, Cl. 435-240.100.

Tejima, Kikuo: *See—*
Kawashima, Yoshiaki; Iwamoto, Taro; and Tejima, Kikuo, 5,180,522, Cl. 252-311.000.

Tektronix, Inc.: *See—*
Dalrymple, John C.; and Bigger, Scott W., 5,181,014, Cl. 340-703.000.

Teleco Oilfield Services Inc.: *See—*
Whitten, Ronald G., 5,181,172, Cl. 364-422.000.

Telecommunications Radioelectriques El Telephoniques: *See—*
Langlais, Thierry; Bastien, Jean-Paul; and Boisson, Jean-Yves, 5,181,229, Cl. 375-114.000.

Telectronics Pacing Systems, Inc.: *See—*
Weiss, Steven M., 5,179,946, Cl. 128-419.00D.

Telefonaktiebolaget L M Ericsson: *See—*
Dent, Paul W., 5,180,993, Cl. 331-16.000.

Telefonaktienbolaget L M Ericsson: *See—*
Kasman, Alexander, 5,181,204, Cl. 371-16.500.

Telefunken electronic GmbH: *See—*
Bommer, Ulrich; and Schairer, Werner, 5,181,084, Cl. 257-94.000.

Temburg, Josef: *See—*
Kranefeld, Andreas; Temburg, Josef; and Marom, Abi, 5,179,878, Cl. 83-13.000.
Zander, Johann; and Temburg, Josef, 5,179,763, Cl. 19-80.00R.

Terada, Eiichi: *See—*
Nakamura, Shinichi; Tubokura, Yutaka; and Terada, Eiichi, 5,180,780, Cl. 525-96.000.

Terada, Ichiro: *See—*
Sugaya, Yoshio; Terada, Ichiro; Sanekata, Kiyonari; and Horie, Hirofumi, 5,180,750, Cl. 521-32.000.

Terada, Keiji: *See—*
Nagao, Makoto; and Terada, Keiji, 5,181,258, Cl. 382-28.000.

Terada, Masahiro; Sugimoto, Nobuji; Watanabe, Toshiro; and Sugimoto, Takashi, to Nissan Motor Co., Ltd.; and Mitsubishi Petrochemical Co., Ltd. Injection-molded article. 5,180,629, Cl. 428-220.000.

Terada, Yasuhiko; Abe, Kazunobu; Uno, Hajime; and Shirasaki, Shinichi, to Sakai Chemical Industry Co., Ltd.; and National Institute for Research in Inorganic Materials. Process for producing powder material for lead perovskite ceramic. 5,180,699, Cl. 501-134.000.

Terada, Yoshiharu: *See—*
Chiba, Katsuyoshi; Katsumoto, Masayuki; Uesaka, Yasutaro; Fukke, Hajime; Ishihara, Heigo; Matsuyama, Iwao; Kodama, Naoki; Inoue, Hitoshi; and Terada, Yoshiharu, 5,180,608, Cl. 427-560.000.

Terao, Shinji; and Maki, Yoshitaka, to Takeda Chemical Industries, Ltd. Quinone derivatives, their production and use. 5,180,742, Cl. 514-558.000.

Teroaka, Reiko: *See—*
Matsuda, Yoshihisa; Teroaka, Reiko; Tanaka, Yukio; and Abe, Hisato, 5,180,747, Cl. 514-681.000.

Terumo Kabushiki Kaisha: *See—*
Hirose, Kazunori, 5,180,244, Cl. 401-264.000.
Ohnishi, Makoto; and Shimura, Kenichi, 5,180,492, Cl. 210-490.000.
Sasaki, Masatomi; and Kashiwagi, Nobuyoshi, 5,180,789, Cl. 525-326.300.

Teska Verbautechnik GmbH: *See—*
Krings, Josef, 5,180,256, Cl. 405-282.000.

Tessier, Jean: *See—*
Babin, Didier; Demoute, Jean-Pierre; and Tessier, Jean, 5,180,741, Cl. 514-531.000.

Teuboi, Hideo: *See—*
Kimura, Yoshikazu; and Teuboi, Hideo, 5,180,173, Cl. 277-96.100.

Texaco Chemical Company: *See—*
Sanderson, John R.; and Knifton, John F., 5,180,864, Cl. 585-10.000.
Sanderson, John R.; Crawford, Wheeler C.; and McCoy, David R., 5,180,866, Cl. 585-12.000.
Sanderson, John R.; and Marquis, Edward T., 5,180,869, Cl. 585-255.000.

Texaco Inc.: *See—*
Nolte, David G.; Haskin, Helen K.; and Colling, Edwin L., Jr., 5,180,556, Cl. 422-109.000.

Texas Instruments Incorporated: *See—*
Mosher, Dan M.; Latham, Larry; Todd, Bob; Blanton, Cornelia H.; Trogolo, Joe R.; and Cotton, David R., 5,181,095, Cl. 257-370.000.
Moslehi, Mehrdad M., 5,180,226, Cl. 374-127.000.
Parikh, Harsh B.; and Crosby, Robert M., 5,181,231, Cl. 377-26.000.

TGTBT, Ltd.: *See—*
Gaon, David; and Wiedersatz, John, 5,180,601, Cl. 426-242.000.

Thangarasu, Appavoo: *See—*
Aldridge, Tod; Fitzgerald, John A.; McGregor, Allan K.; Quates, Ronald D.; Schoen, Rudolf R.; Thangarasu, Appavoo; and Vicic, John C., 5,180,008, Cl. 166-84.000.

Therma-Wave, Inc.: *See—*
Fanton, Jeffrey T.; Opsal, Jon; and Rosencwaig, Allan, 5,181,080, Cl. 356-381.000.

Thibeault, Roland. Drive train enable-disable vehicle use device. 5,179,868, Cl. 74-411.500.

Thierry, Annette: *See—*
Le Moigne, Jacques; Thierry, Annette; and Guerder, Pierre, 5,180,463, Cl. 156-603.000.

Thiokol Corporation: *See—*
Lund, Gary K.; Spinti, Mark J.; and Doll, Daniel W., 5,180,452, Cl. 149-19.900.

Thiry, Steven A.; Meister, Ronald J.; and Ropp, David J., to Ingersoll-Rand Company. Power tool having selectable inlet location. 5,180,019, Cl. 173-168.000.

Thoenen, Hans: *See—*
Barde, Yves-Alain; Leibrock, Joachim; Lottspeich, Friedrich; Yancopoulos, George; and Thoenen, Hans, 5,180,820, Cl. 536-23.510.

Thomanek, Walter, to Allied-Signal Inc. Optical equipment mounting device. 5,179,735, Cl. 2-6.000.

Thomas, Daniel W.: *See—*
Jacobs, William, III; Luciw, Fred W.; Kancans, Ilze B.; Thomas, Daniel W.; Boldizer, Leslie; and Lees, Robert G., 5,180,835, Cl. 548-303.400.

Thomas, David D. Exercise bar apparatus. 5,180,350, Cl. 482-40.000.

Thomas, Dennis A.; Goulait, David J. K.; and Cox, Robert G., Jr., to Procter & Gamble Company, The. Process of manufacturing a refastenable mechanical fastening system. 5,180,534, Cl. 264-145.000.

Thomas, Malcolm W.: *See—*
Cowie, Theo D.; Malan, John M.; and Thomas, Malcolm W., 5,181,018, Cl. 340-825.310.

Thompson, Christopher H. Newspaper alert apparatus. 5,180,101, Cl. 232-34.000.

Thompson, Ernest R., Jr. Pipe jointing system. 5,180,197, Cl. 285-351.000.

Thomson-Brandt Armements: *See—*
Bansard, Joel, 5,180,882, Cl. 102-216.000.

Thomson Consumer Eletronics: *See—*
Guerin, Jean-Claude; and Morel, Philippe, 5,181,098, Cl. 358-10.000.

Thomson Consumer Electronics: *See—*
Artigalas, Max, 5,181,102, Cl. 358-56.000.

Thomson Consumer Electronics, Inc.: *See—*
Nortrup, Kevin E., 5,180,934, Cl. 307-518.000.
Swank, Harry R., 5,181,123, Cl. 358-246.000.

Thomson-CSF: *See—*
Nicolas, Christophe; Loiseaux, Brigitte; Huignard, Jean-Pierre; and Puech, Claude, 5,181,054, Cl. 353-20.000.

Thornton, Steve: *See—*
Powers, James C.; May, Sheldon W.; Hernandez, Maria A.; Thornton, Steve; and Glinski, Jan, 5,180,831, Cl. 546-291.000.

Thorward, Nora J. String instrument tuning guard. 5,180,876, Cl. 84-293.000.

Threshold Control Systems CC: *See—*
Cowie, Theo D.; Malan, John M.; and Thomas, Malcolm W., 5,181,018, Cl. 340-825.310.

Thuer, Markus; Stucki, Gerhard; and Boss, Roland, to Ciba-Geigy Corporation. Water purification process. 5,180,495, Cl. 210-605.000.

Thurman, Laurance R.; and Harris, James B., to BASF Corporation. Processes for preparing 2,2,4-trimethyl-1,3-pentanediol derivatives. 5,180,847, Cl. 560-238.000.

Tiernan, Richard J., Jr.: *See—*
Burge, Joseph C.; and Tiernan, Richard J., Jr., 5,180,281, Cl. 415-209.200.

Timberlake, Larry D.; and Brennan, James L., to Great Lakes Chemical Corporation. Process for the production and recovery of halonitroalkanes in high yield. 5,180,859, Cl. 568-946.000.

Ting, David M. T.: *See—*
Smith, Robert M.; Ting, David M. T.; Boer, Jan H.; and Mendelssohn, Marvin, 5,181,162, Cl. 364-419.000.

Tinsley, Otis B.; and Yngve, Paul W., to Du Pont de Nemours, E. I., and Company. Alternate twist plied yarn. 5,179,827, Cl. 57-204.000.

Todd, Bob: *See—*
Mosher, Dan M.; Latham, Larry; Todd, Bob; Blanton, Cornelia H.; Trogolo, Joe R.; and Cotton, David R., 5,181,095, Cl. 257-370.000.

Togashi, Fusao: *See—*
Masui, Susumu; Sakata, Kei; and Togashi, Fusao, 5,180,449, Cl. 148-533.000.

Tokai Co., Ltd.: *See—*
Nakamura, Yoshizo; Oyabu, Kenzo; and Tomozawa, Nakanori, 5,179,795, Cl. 38-143.000.

Tokai Rubber Industries, Ltd.: *See—*
Muramatsu, Atsuhi, 5,180,148, Cl. 267-140.140.

Tokashiki, Michiyuki: *See*—
Ichikawa, Yataro; Hamamoto, Kimihiko; and Tokashiki, Michiyuki, 5,180,676, Cl. 435-240.100.
Tokkyo Kiki Kabushiki Kaisha: *See*—
Choshitani, Hitoshi; Osaka, Takahide; Itojima, Fumiaki; and Yasuda, Masashi, 5,180,958, Cl. 318-623.000.
Tokoro, Masayoshi: *See*—
Abe, Shizuo; Tokoro, Masayoshi; and Kawauchi, Masato, 5,179,915, Cl. 123-41.790.
Tokunaga, Yosimitu: *See*—
Yoshino, Syoichi; Izaki, Hiroshi; Yoshino, Masanori; Kasai, Fumio; Tokunaga, Yosimitu; and Ishiki, Naotsugu, 5,180,539, Cl. 266-202.000.
Tokura, Kunihiko: *See*—
Uryu, Masaru; Tokura, Kunihiko; and Muraoka, Kyouji, 5,180,785, Cl. 525-240.000.
Tokyo Electric Co., Ltd.: *See*—
Kitahara, Satoshi; Koyama, Shuji; and Shiozaki, Tsugio, 5,180,236, Cl. 400-175.000.
Tokyo Electron Limited: *See*—
Ibuka, Shigehito; and Lee, Hideki, 5,180,692, Cl. 437-240.000.
Tokyo Ohka Kogyo Co., Ltd.: *See*—
Miyabe, Masanori; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,180,653, Cl. 430-296.000.
Tominaga, Tetsuyoshi: *See*—
Arima, Yukio; Yanagimoto, Hiroaki; Kunitomo, Yuichi; and Tominaga, Tetsuyoshi, 5,179,954, Cl. 128-660.070.
Tomioka, Hiroki; Sakamoto, Noriyasu; Umeda, Kimitoshi; Fujimoto, Hiroaki; Ishiwatari, Takao; and Kisida, Hirosi, to Sumitomo Chemical Company, Limited. 4-tert.-butyl imidazole derivative and use. 5,180,732, Cl. 514-396.000.
Tomioka, Kenichi: *See*—
Mase, Toshiyasu; Tsuzuki, Ryuji; Hara, Hiromu; Murase, Kiyoshi; and Tomioka, Kenichi, 5,180,730, Cl. 514-348.000.
Tomiyama, Koichi: *See*—
Kukimoto, Tsutomu; Yusa, Hiroshi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; and Kuwashima, Tetsuhito, 5,180,649, Cl. 430-106.600.
Tomozawa, Nakanori: *See*—
Nakamura, Yoshizo; Oyabu, Kenzo; and Tomozawa, Nakanori, 5,179,795, Cl. 38-143.000.
Tonen Corporation: *See*—
Tsurutani, Kazushi; Hosogai, Daijiro; Kokubo, Kakuro; Kobayashi, Taiji; Higashimoto, Noboru; Endoh, Masami; Namiyama, Kazuyoshi; and Yoneda, Makoto, 5,179,923, Cl. 123-435.000.
Tong, Po; and Ruetz, Peter, to LSI Logic Corporation. Method and apparatus for decoding huffman codes by detecting a special class. 5,181,031, Cl. 341-65.000.
Topworks, Inc.: *See*—
Leinen, Chris M.; and Schendel, Robert E., 5,179,887, Cl. 91-387.000.
Schendel, Robert E.; and Leinen, Chris M., 5,179,888, Cl. 91-387.000.
Toray Engineering Co., Ltd.: *See*—
Iwade, Takashi; and Nagata, Kosei, 5,179,764, Cl. 19-245.000.
Toray Industries, Inc.: *See*—
Iwayama, Kazuyoshi; and Honda, Hiroaki, 5,180,862, Cl. 570-202.000.
Kubota, Koichi; Katoh, Tetsuya; Hirata, Masayuki; and Hayashi, Kazuya, 5,180,402, Cl. 8-490.000.
Torisawa, Nobuyuki: *See*—
Matsui, Toshitaka; Torisawa, Nobuyuki; and Yazawa, Yoshiyuki, 5,180,156, Cl. 271-103.000.
Torok, Vilmos: *See*—
Loreth, Andrzej; and Torok, Vilmos, 5,180,404, Cl. 55-117.000.
Tortosa, Serge: *See*—
Grand, Jean-Paul; Juvigny, Daniel; Vinuesa, Andre ; and Tortosa, Serge, 5,180,537, Cl. 266-45.000.
Toshiaki, Wada: *See*—
Yamashita, Masami; Iwato, Noboru; Mine, Hideki; and Toshiaki, Wada, 5,181,151, Cl. 360-126.000.
Toshiba Machine Co., Ltd.: *See*—
Nakamura, Ei; Sasaki, Mitsuo; and Nakamura, Hiromi, 5,180,609, Cl. 427-595.000.
Touge, Yoshiyuki; and Yoneyama, Yoshito, to Canon Kabushiki Kaisha. Apparatus for and method of fractionating particle in particle-suspended liquid in conformity with the properties thereof. 5,180,065, Cl. 209-577.000.
Townsend, Daniel R.; and White, William D., to Townsend, Daniel R. Magnetic removable display for eyeglasses. 5,181,051, Cl. 351-52.000.
Toy Seikan Kaisha Ltd.: *See*—
Matsui, Kenzo; and Imaru, Katsuhiro, 5,179,854, Cl. 72-349.000.
Toyo Seikan Kaisha Ltd.: *See*—
Sugiyama, Ikuo; Ishibashi, Kazuhisa; Takakusaki, Nobuyuki; Maruhashi, Yoshitsugu; Nishimura, Yasushi; Koyama, Hiroshi; Iida, Setsuko; and Sato, Koji, 5,180,893, Cl. 219-10.430.
Toyobo Co., Ltd.: *See*—
Watanabe, Kazuo; Tuchida, Toshio; and Schultz, Duane R., 5,180,743, Cl. 514-565.000.
Toyoda, Nubuo, to Suzuki Motor Corporation. Structure for vehicular body of automotive vehicle. 5,180,206, Cl. 296-204.000.
Toyoshima, Yoshiki: *See*—
Ohmae, Tadayuki; Toyoshima, Yoshiki; Tanaka, Hisao; Okada, Mitsuyuki; and Fujita, Harunori, 5,180,784, Cl. 525-207.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Abe, Shizuo; Tokoro, Masayoshi; and Kawauchi, Masato, 5,179,915, Cl. 123-41.790.
Hokazono, Yuichi; and Konomi, Toshiaki, 5,179,917, Cl. 123-52.0MF.
Trajkovic, Ljiljana: *See*—
Fang, San-Chin; Melville, Robert C.; and Trajkovic, Ljiljana, 5,181,179, Cl. 364-488.000.
Trakas, Panos. Internally heated sprue bushing with thermally conductive sleeve. 5,180,594, Cl. 425-547.000.
Tran, Khanh C.: *See*—
Abousabha, Naji G.; and Tran, Khanh C., 5,180,292, Cl. 417-273.000.
Transgene, S. A.: *See*—
Drillien, Robert; and Spehner, Daniele, 5,180,675, Cl. 435-235.100.
Trentacoste, Terence: *See*—
Halstead, Gary A.; Barten, Brian L.; and Trentacoste, Terence, 5,180,098, Cl. 228-183.000.
Trew, Robert J.: *See*—
Mishra, Umesh K.; and Trew, Robert J., 5,180,681, Cl. 437-40.000.
Trice, Jennifer L.: *See*—
Lovejoy, Michael W.; and Trice, Jennifer L., 5,179,852, Cl. 72-53.000.
Tridon Limited: *See*—
Buechele, Franz; and Dipple, Stephen G., 5,179,761, Cl. 15-250.420.
Trimble, Robert R.: *See*—
Schwartz, Robert E.; and Trimble, Robert R., 5,180,302, Cl. 431-348.000.
Tripier, Dominique: *See*—
Crause, Peter; Habermann, Paul; and Tripier, Dominique, 5,180,668, Cl. 435-69.200.
Triton Technologies, Inc.: *See*—
Glynn, Brian J., 5,181,181, Cl. 364-566.000.
Trogolo, Joe R.: *See*—
Mosher, Dan M.; Latham, Larry; Todd, Bob; Blanton, Cornelia H.; Trogolo, Joe R.; and Cotton, David R., 5,181,095, Cl. 257-370.000.
Troncoso, Fernando, Jr. Handgun brace and assembly. 5,180,874, Cl. 042-72.000.
Trube, Hans: *See*—
Epple, Anton; Trube, Hans; and Pfeiffer, Martin, 5,179,759, Cl. 15-250.130.
Trumbo, Brian A., to International Business Machines Corporation. Digitizer tablet with internally stored wireless stylus. 5,180,891, Cl. 178-18.000.
Trutzschler GmbH & Co. KG: *See*—
Kranefeld, Andreas; Temburg, Josef; and Marom, Abi, 5,179,878, Cl. 83-13.000.
Zander, Johann; and Temburg, Josef, 5,179,763, Cl. 19-80.00R.
TRW Inc.: *See*—
Wang, Mansheng; and Given, Bruce A., 5,180,625, Cl. 428-212.000.
Trylon Corporation, The: *See*—
Lonky, Neal M., 5,179,938, Cl. 128-18.000.
Tsuboi, Kiyoshi, to Iwatsu Electric Co., Ltd.; and Honda Giken Kogyo Kabushiki Kaisha. Defect detecting method and apparatus. 5,179,860, Cl. 73-579.000.
Tsubouchi, Kazuo: *See*—
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Masu, Kazuya, 5,180,687, Cl. 437-187.000.
Tsuchimoto, Yoshihiro; Ikezawa, Toshikazu; Morihiro, Naoki; and Shimizu, Naoya, to Asahi Glass Company Ltd. Apparatus for forming a glass product and a method for forming a glass product. 5,180,412, Cl. 65-66.000.
Tsuda, Shigenori: *See*—
Katayama, Yasuyuki; Ishimoto, Yasuhiko; Horide, Fumio; Tsuda, Shigenori; and Nishioka, Fumio, 5,180,420, Cl. 504-116.000.
Tsujino, Kazuhiro, to Sanyo, Electric Co., Ltd. Battery charging apparatus. 5,180,961, Cl. 320-20.000.
Tsukuta, Kenji; and Iikubo, Tomohito, to Daido Tokushuko Kabushiki Kaisha. Oxide-dispersion-strengthened niobum-based alloys and process for preparing. 5,180,446, Cl. 148-422.000.
Tsunoda, Hideo; and Ichikawa, Yoshihiro, to Kabushiki Kaisha Toshiba. Book type wireless remote control apparatus. 5,181,024, Cl. 340-825.690.
Tsurutani, Kazushi; Hosogai, Daijiro; Kokubo, Kakuro; Kobayashi, Taiji; Higashimoto, Noboru; Endoh, Masami; Namiyama, Kazuyoshi; and Yoneda, Makoto, to Tonen Corporation. Fuel supply control method and ultrasonic atomizer. 5,179,923, Cl. 123-435.000.
Tsutsui, Hiroshi: *See*—
Hayakawa, Yuichi; Iwakura, Takeshige; Tsutsui, Hiroshi; Hirano, Atsushi; and Miyazaki, Makoto, 5,181,150, Cl. 360-121.000.
Tsuzuki, Ryuji: *See*—
Mase, Toshiyasu; Tsuzuki, Ryuji; Hara, Hiromu; Murase, Kiyoshi; and Tomioka, Kenichi, 5,180,730, Cl. 514-348.000.
Tubokura, Yutaka: *See*—
Nakamura, Shinichi; Tubokura, Yutaka; and Terada, Eiichi, 5,180,780, Cl. 525-96.000.
Tucci, James M.: *See*—
Christian, Donald J.; Robertson, Graham D.; Tucci, James M.; and Westcott, Michael J., 5,180,122, Cl. 244-134.00F.
Tuchida, Toshio: *See*—
Watanabe, Kazuo; Tuchida, Toshio; and Schultz, Duane R., 5,180,743, Cl. 514-565.000.

Tucker, Darryl W.: *See*—
Dierenbach, Karl; Jacoby, Elliot G., Jr.; Snavely, Dan A.; Tucker, Darryl W.; Walck, Scott N.; and Walck, Scott N., 5,180,886, Cl. 174-66.000.
Tunturipyora Oy: *See*—
Saarinen, Sulevi, 5,180,348, Cl. 482-6.000.
Turbines S.M.S. Inc.: *See*—
Handfield, Louis, 5,180,106, Cl. 239-14.200.
Turley, John W.; and Sendzimir, Michael G., to T. Sendzimir, Inc. Crown adjustment control system for cluster mills. 5,179,851, Cl. 72-7.000.
Turner, James A., to DowElanco. 4-((aryloxy)phenoxy)fluoroalkanoic acid derivatives and their herbicidal uses. 5,180,417, Cl. 504-246.000.
Tweardy, Lisa A. G.: *See*—
Moore, George E.; and Tweardy, Lisa A. G., 5,180,361, Cl. 602-18.000.
Twist Inc.: *See*—
Given, Michael S.; and Wright, Joe W., 5,180,149, Cl. 267-180.000.
Twose, David L.: *See*—
Ballard, Denis G. H.; Haddleton, David M.; and Twose, David L., 5,180,799, Cl. 526-177.000.
Tyler, Paul J., to Westinghouse Electric Corp. Method and apparatus for downline load rejection sensing in a gas turbine control system. 5,180,923, Cl. 290-40.00C.
Ube Industries, Ltd.: *See*—
Inoue, Hiroshi; Takabayashi, Seiichirou; Muramatsu, Tadao; Funagoshi, Tsutomu; and Hirano, Tetsuji, 5,180,627, Cl. 428-214.000.
Uchida, Manabu; Ushioda, Makoto; and Goto, Yasuyuki, to Chisso Corporation. Alkenyl ether derivative and liquid crystal composition containing the same. 5,180,519, Cl. 252-299.630.
Uchida, Norio; and Kikuiri, Nobutaka, to Kabushiki Kaisha Toshiba. Method and apparatus for setting the gap distance between a mask and a wafer at a predetermined distance. 5,179,863, Cl. 73-865.800.
Uchida, Shinji: *See*—
Nishiwaki, Seiji; Uchida, Shinji; and Asada, Junichi, 5,181,265, Cl. 385-33.000.
UCP Gen-Pharma, AG: *See*—
Grutter, Markus G.; Heinz, Dirk; and Liersch, Manfred, 5,180,667, Cl. 435-69.200.
Udagawa, Yoshiro; and Takiguchi, Hideo, to Canon Kabushiki Kaisha. Color image correction based on characteristics of a highlights or other predetermined image portion. 5,181,105, Cl. 358-80.000.
Udden, Per; and Ober, Jan K. Method and apparatus for the measurement of rapid light variation superimposed on a slowly changing background light intensity. 5,180,907, Cl. 250-205.000.
Ueda, Makoto: *See*—
Yoshioka, Ritsuo; Ueda, Makoto; Motora, Yuichi; and Nakamura, Mitsuharu, 5,180,544, Cl. 376-333.000.
Ueda, Tetsuya; Suzuki, Naoki; and Yano, Kohsaku, to Matsushita Electric Industrial Co., Ltd. Microwave plasma film deposition system. 5,180,436, Cl. 118-723.000.
Ueda, Yasuhiro: *See*—
Nagayoshi, Mitsugu; Miyazaki, Atsushi; Miyanaga, Hirofumi; Takehana, Sakae; Adachi, Hideyuki; Ueda, Yasuhiro; Fuse, Eiichi; and Aoki, Yoshisada, 5,179,934, Cl. 128-4.000.
Uehara, Masaki: *See*—
Isowa, Yoshikazu; Sato, Yoshiaki; Nakashima, Yoshiharu; Masaki, Mitsuo; Miyake, Norihisa; Uehara, Masaki; and Hirate, Kenji, 5,180,712, Cl. 514-16.000.
Ueno, Hiroshi; Hatabu, Shoji; Kumata, Etsuko; and Adachi, Takehiro, to Koyo Seiko Co., Ltd. Member for retaining rolling bodies. 5,180,231, Cl. 384-527.000.
Ueno, Shigeru: *See*—
Yasunaga, Kuniaki; and Ueno, Shigeru, 5,180,755, Cl. 521-116.000.
Uesaka, Yasutaro: *See*—
Chiba, Katsuyoshi; Katsumoto, Masayuki; Uesaka, Yasutaro; Fukke, Hajime; Ishihara, Heigo; Matsuyama, Iwao; Kodama, Naoki; Inoue, Hitoshi; and Terada, Yoshiharu, 5,180,608, Cl. 427-560.000.
Fukke, Hajime; Akagi, Motoo; Matsuyama, Iwao; Katsumoto, Masayuki; Inoue, Hitoshi; Kodama, Naoki; and Uesaka, Yasutaro, 5,180,616, Cl. 428-64.000.
Ueta, Koki; Kamada, Naoki; Mori, Hideo; Endo, Suehiro; and Tajima, Susumu, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Starter having a contaminant-proof struture of a sliding portion. 5,179,864, Cl. 74-7.00A.
Ultimate Manufacturing: *See*—
Justice, Kyle A., 5,180,323, Cl. 446-120.000.
Umeda, Kazuyoshi; and Nakamoto, Funiaki, to Teijin Chemicals, Ltd. Process for producing granular fire retardant. 5,180,525, Cl. 252-609.000.
Umeda, Kimitoshi: *See*—
Tomioka, Hiroki; Sakamoto, Noriyasu; Umeda, Kimitoshi; Fujimoto, Hiroaki; Ishiwatari, Takao; and Kisida, Hirosi, 5,180,732, Cl. 514-396.000.
Umise, Shigeki; and Imamura, Hirokatsu, to Dai Nippon Insatsu Kabushiki Kaisha. Method of manufacturing strips of thermal transfer recording sheets. 5,180,607, Cl. 427-8.000.
Uneme, Hideki; Higuchi, Noriko; and Minamida, Isao, to Takeda Chemical Industries, Ltd. Process for the preparation of chlorothiazole derivatives. 5,180,833, Cl. 548-202.000.
Uni-Charm Corporation: *See*—
Mende, Takayuki, 5,180,620, Cl. 428-138.000.
Unilever Patent Holdings B.V.: *See*—
Briggs, David H.; and Freeman, Richard F., 5,180,895, Cl. 219-10.55F.
Union Carbide Chemicals & Plastics Technology Corporation: *See*—
Abatjoglou, Anthony G.; Bryant, David R.; and Peterson, Ronald R., 5,180,854, Cl. 568-454.000.
Rogers, Charles E.; and Schmidt, Gertraud A., 5,180,889, Cl. 174-113.00R.
Union Special Corporation: *See*—
Gaudlitz, Robert, 5,180,035, Cl. 184-6.150.
United Container Machinery Group, Inc.: *See*—
Hyde, Glenn F.; and White, Gene J., 5,180,448, Cl. 148-525.000.
United Microelectronics Corporation: *See*—
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DiDio, Gary M.; Jones, Kermit; Hoffman, Kevin; Laarman, Timothy; Call, Jon; and Nath, Prem, 5,180,434, Cl. 118-718.000.
United States Borax & Chemical Corporation: *See*—
Woods, William G., 5,180,517, Cl. 252-186.270.
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Stern, Richard A.; and Babbitt, Richard W., 5,180,997, Cl. 333-24.200.
Energy: *See*—
Lee, Yee-Chun, 5,181,016, Cl. 340-788.000.
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McCrillis, Robert C.; Butts, Nelson L.; Ponder, Wade H.; and Abbott, James H., 5,179,933, Cl. 126-77.000.
Health and Human Services: *See*—
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Rorvig, Mark E., 5,181,259, Cl. 382-36.000.
Voellmer, George, 5,180,259, Cl. 408-124.000.
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Egnor, Michael E., 5,180,309, Cl. 434-323.000.
Moberg, Victor L., 5,181,212, Cl. 372-22.000.
U.S. Philips Corporation: *See*—
Austermann, Ralf, 5,180,960, Cl. 318-701.000.
Durr, Rene C., 5,180,949, Cl. 315-111.510.
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Seitz, Reinhold; and Weidner, Hans-Jurgen, 5,181,168, Cl. 361-427.000.
United States Surgical Corporation: *See*—
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United Technologies Corporation: *See*—
Barcza, William K.; and Kessell, Steven M., 5,179,832, Cl. 60-261.000.
Burge, Joseph C.; and Tiernan, Richard J., Jr., 5,180,281, Cl. 415-209.200.
Davis, Dennis W.; and Scalise, Stanley, 5,181,138, Cl. 359-239.000.
Deichmann, Richard E., 5,179,968, Cl. 135-88.000.
Warner, John L., 5,180,278, Cl. 415-27.000.
Unitika, Ltd.: *See*—
Furukawa, Shinji; Oka, Kazuki; and Tanimura, Akira, 5,181,020, Cl. 340-551.000.
University of California, Regents of the: *See*—
Hornburg, Wynn E.; and Beumer, John, III (said John Beumer, III assors. to), 5,180,303, Cl. 433-173.000.
Martin, Kenneth W.; and Buchwald, Aaron W., 5,180,994, Cl. 331-38.000.
Parsons, C. Lowell, 5,180,715, Cl. 514-54.000.
Smith, Paul; and Wittmann, Jean C., 5,180,470, Cl. 156-600.000.
Snyder, James J., 5,181,224, Cl. 372-101.000.
Yaksh, Tony L.; and Hill, Harlan F., 5,180,716, Cl. 514-58.000.
University of Colorado Foundation, Inc., The: *See*—
Cech, Thomas R.; and Herschlag, Daniel, 5,180,818, Cl. 536-23.100.
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Gibby, Gordon L.; Lampotang, Samsun; Hathiram, Daraius; and Gravenstein, Nikolaus, 5,180,896, Cl. 219-10.55A.
University of Georgia Research Foundation, Inc.: *See*—
Miller, Lois K.; and O'Reilly, David R., 5,180,581, Cl. 424-93.00A.
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Stinski, Mark F., 5,180,813, Cl. 530-388.300.
University of Minnesota, Regents of the: *See*—
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University of Ottawa, The: *See*—
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University of Pennsylvania, The Trustees of the: *See*—
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University of Virginia Alumni Patents Foundation: *See*—
Bruns, David; and Benjamin, David, 5,180,663, Cl. 435-7.400.
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El-Sharkawi, Mohamed A.; Andexler, George; and Silberkleit, Lee I., 5,180,963, Cl. 323-211.000.
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Uno, Hajime: *See*—
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Frame, Robert R.; Bricker, Jeffery C.; Stine, Laurence O.; and Verachtert, Thomas A., 5,180,484, Cl. 208-189.000.
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Urabe, Kenzo; and Akaiwa, Yoshihiko, to Kokusai Electric Co., Ltd. Multi-level band-restricted waveform generator. 5,181,182, Cl. 364-718.000.
Urayama, Kiyoshi; and Sato, Masanori, to Sony Corporation. Tape cassette reel having a wing-type upper flange. 5,180,116, Cl. 242-71.800.
Urbanski, Jeffrey C.: *See—*
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Urdal, David L.: *See—*
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Uryu, Masaru; Tokura, Kunihiko; and Muraoka, Kyouji, to Sony Corporation. Diaphragm and method for producing same. 5,180,785, Cl. 525-240.000.
Usagawa, Toshiyuki; Imamura, Yoshinori; Okuhira, Hidekazu; Goto, Shigeo; Kobayashi, Masayoshi; and Takatani, Shinichiro, to Hitachi, Ltd. Semiconductor device and method of producing the same. 5,181,087, Cl. 257-194.000.
Usami, Toshiro: *See—*
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Ushioda, Makoto: *See—*
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Uyttenhove, Catherine: *See—*
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Vahabzadeh, Hamid; and Koivunen, Erkki A., to General Motors Corporation. Guide mechanism for a traveling chain transmission. 5,180,340, Cl. 474-111.000.
Vahabzadeh, Hamid; and Koivunen, Erkki A., to General Motors Corporation. Derailing mechanism for a traveling chain transmission. 5,180,341, Cl. 474-111.000.
Vailati, Italo: *See—*
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Marsais, Christian; and Letrange, Frederic, 5,180,005, Cl. 165-178.000.
Marsais, Christian; and Letrange, Frederic, 5,180,006, Cl. 165-178.000.
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Van Doorne's Transmissie, B.V.: *See—*
Van der Zande, Cornelis P., 5,180,345, Cl. 474-201.000.
Van Alstine, Guy A. Tire groover cutting head member having fixed insulator. 5,179,782, Cl. 30-140.000.
Van Ast, Camille I.: *See—*
Bak, Chan S.; Miller, Leroy J.; and Van Ast, Camille I., 5,179,993, Cl. 164-46.000.
van Beem, Nicole: *See—*
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Vander Sande, John B.: *See—*
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van der Werff, Jeichienus A., to Hadewe B. V. Method and apparatus for removing contents from an envelope. 5,179,820, Cl. 53-492.000.
Van der Zande, Cornelis P., to Van Doorne's Transmissie, B.V. Driving belt provided with transverse elements and transverse elements for such driving belt. 5,180,345, Cl. 474-201.000.
Van Ee, Marvin D., to Case Corporation. Device for maintaining belt alignment. 5,180,342, Cl. 474-123.000.
Van Hofwegen, Lloyd; Hsung, Jean-Cheui; and Huntwork, Daniel, to Cardiac Pacemakers, Inc. Defibrillation/cardioversion system with multiple evaluation of heart condition prior to shock delivery. 5,179,945, Cl. 128-419.00D.
Van Kalsbeek, Dorothy J. Stitchery light-base and clamp. 5,180,220, Cl. 362-98.000.
Van Kuijk, Rudolf M., to General Electric Company. Boiling water reactor with downcomer steam release channel. 5,180,546, Cl. 376-371.000.
Van Kuijk, Rudolf M., to General Electric Company. Boiling water reactor with staggered chimney. 5,180,547, Cl. 376-377.000.
Van Loan, David R.; Johnston, Charles J.; and Swart, Mark A., to Everett/Charles Contact Products, Inc. Integrated circuit carrier having built-in circuit verification. 5,180,976, Cl. 324-158.00F.
Van Niekerk, Johannes A., to Caledon Riviersonderend Kooperasie Beperk. Method of sampling, and sampling device. 5,179,859, Cl. 73-864.640.
Van Snick, Jacques: *See—*
Druez, Catherine; Coulie, Pierre; Uyttenhove, Catherine; and Van Snick, Jacques, 5,180,678, Cl. 436-501.000.
Van Valkenburgh, Virginia M.: *See—*
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Vargo, William R., to Hardy Manufacturing, Inc. Connection for a structural rack system. 5,180,068, Cl. 211-191.000.
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Vassiliadis, Arthur; Shaffer, Joseph W.; Fullmer, David J.; Brewer, Michael H.; Hennings, David R.; and Myers, Terry D., to American Dental Laser, Inc. Method for apical fusion of the foramina. 5,180,304, Cl. 433-224.000.
Vatant, Robert A.; Courbier, Michel F.; and Weiss, Andre , to Creusot-Loire Industrie; and Clecim. Device and method for feeding molten metal for the pressure casting of metal products. 5,180,538, Cl. 266-91.000.
Veenstra, Siem J.: *See—*
Kump, Wilhelm; Borel, Christian; Chen, Jen; Veenstra, Siem J.; Francis, John; and Mugrage, Benjamin B., 5,180,718, Cl. 514-183.000.
Vegoe, Brett R.; and Molacek, Richard L., to Medtronic, Inc. Splittable catheter and method. 5,180,372, Cl. 604-161.000.
Velcro Industries B.V.: *See—*
Kessler, William P.; Clutch, Dennis R.; and Kennedy, William J., 5,180,618, Cl. 428-100.000.
Venet, Marc G.: *See—*
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Dietrick, Gerald P.; and Vagedes, Michael J., 5,180,488, Cl. 210-232.000.
Venturello, Carlo; and Cavallotti, Claudio, to Ausimont S.r.l. Heterocyclic peroxides having N-amidic heteroatoms useful as bleaching agents. 5,180,516, Cl. 252-186.100.
Verachtert, Thomas A.: *See—*
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Verdier, Michel, to Framatome; and Compagnie Generale Des Matieres Nucleaires. Grid having mixing fins for a nuclear fuel assembly. 5,180,548, Cl. 376-439.000.
Veregin, Richard P. N.: *See—*
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VeriFone Inc.: *See—*
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Vernieres, Raymond F. J.: *See—*
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Vernon, Geoffrey W.: *See—*
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Vicic, John C.: *See—*
Aldridge, Tod; Fitzgerald, John A.; McGregor, Allan K.; Quates, Ronald D.; Schoen, Rudolf R.; Thangarasu, Appavoo; and Vicic, John C., 5,180,008, Cl. 166-84.000.
Vick, Walter. Apparatus for cleaning sensitive surfaces, in particular optical glasses. 5,180,243, Cl. 401-195.000.
Vickery, Earle R., III. Manual two-stage air pump. 5,180,283, Cl. 417-234.000.
Victaulic Company of America: *See—*
Rung, Robert; and Dole, Douglas R., 5,180,193, Cl. 285-55.000.
Victor Company of Japan, Ltd.: *See—*
Ohyama, Minoru; Yamazaki, Tetsuhiro; Inoue, Hiroshi; and Konno, Toshio, 5,180,909, Cl. 250-216.000.
Vieau, David P.: *See—*
Durand, David; Vieau, David P.; Chu, Ang-Ling; and Weiu, Tai S., 5,180,523, Cl. 252-512.000.
Vigneault, Richard E.; Wagner, William S.; Weisskopf, Klaus; Williamson, R. Edward; and Woodward, A. John, to Hoechst Celanese Corporation. Flame resistant, low pilling polyester fiber. 5,180,793, Cl. 525-446.000.
Vining, John E., Sr.: *See—*
Anderson, Robert M.; Vining, John E., Sr.; and Patton, Lloyd L., Sr., 5,180,437, Cl. 134-10.000.
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Vix Design Products, Inc.: *See—*
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VLSI Technology, Inc.: *See—*
Cook, Roger D.; and Milina, Daniel V., 5,180,467, Cl. 156-643.000.
Frenkil, Gerald L., 5,181,203, Cl. 371-15.100.
Voellmer, George, to United States of America, National Aeronautics and Space Administration. Retractable tool bit having latch type catch mechanism. 5,180,259, Cl. 408-124.000.

Voges, Heinz-Werner: *See*—
Stehr, Michael; and Voges, Heinz-Werner, 5,180,856, Cl. 568-617.000.

Vohra, Rohini: *See*—
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Vojtech, Strnad, to Isover Saint-Gobain. Method and apparatus for melting materials containing inorganic material fibers by the supply of oxygen rich gas. 5,179,902, Cl. 110-248.000.

Vollmer, Hans-Jurgen: *See*—
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Volz, Karl: *See*—
Hinz, Joachim; Schneid, Josef; Steidele, Andreas; Volz, Karl; and Stotz, Wolf-Gunter, 5,179,894, Cl. 100-163.00A.

von Benda, Klaus: *See*—
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Von Sacken, Ulrich, to Moli Energy (1990) Limited. Hydrides of lithiated nickel dioxide and secondary cells prepared therefrom. 5,180,574, Cl. 423-594.000.

Vorsmann, Franz. Rolling shutter for cover part of wall or roof opening, especially for roof window. 5,179,988, Cl. 160-32.000.

Voss, Richard, to Richard Voss Grubenausbau GmbH. Pressure-relief valve with stepped or double piston. 5,180,443, Cl. 137-494.000.

Vroomans, Hubertus J., to Stamicarbon B.V. Graft-modified linear low-density polyethylenes, process for their preparation and the application thereof. 5,180,788, Cl. 525-285.000.

W.R. Grace & Co.-Conn.: *See*—
Gartner, Ellis M.; and Ferraris, Chiara F., 5,180,430, Cl. 106-730.000.
Havens, Marvin R., 5,180,615, Cl. 428-35.300.
Ziebarth, Michael S.; Hager, Michael J.; Beeckman, Jean W.; and Plecha, Stanislaw, 5,180,703, Cl. 502-243.000.

W. Schlafhorst AG & Co.: *See*—
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Wagener, Thomas J.: *See*—
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Wagner, James R.: *See*—
Hellyer, Richard A.; Wagner, James R.; Pees, James M.; and Lohmann, Detlef, 5,180,144, Cl. 267-64.190.

Wagner, Rudolf; and Hirscher, Hans, to Balzers Aktiengesellschaft. Workpiece carrier with suction slot for a disk-shaped workpiece. 5,180,000, Cl. 165-80.100.

Wagner, William S.: *See*—
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Wahl, Friedrich; Maurer-Rothmann, Andrea; and Merkenich, Karl, to BK Ladenburg GmbH. Process for the production of an aqueous suspension of hydroxylapatite. 5,180,564, Cl. 423-309.000.

Waits, Susan: *See*—
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Wakabayashi, Shigeru; Hirose, Shoji; Nishioka, Shoji; and Fujikawa, Yasuji, to Shikoku Kakoki Co., Ltd. Carton blank erecter and feeder. 5,180,356, Cl. 493-316.000.

Wakamiya, Wataru; Tanaka, Yoshinori; Eimori, Takahisa; Ozaki, Hiroji; Kimura, Hiroshi; and Satoh, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing stacked capacitor type semiconductor memory device. 5,180,683, Cl. 437-47.000.

Wakamiya, Wataru: *See*—
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Wakana, Takayuki; and Yamauchi, Satomi, to Mitsubishi Denki K.K. Method and apparatus for controlling a sewing machine. 5,180,954, Cl. 318-369.000.

Wakefield, Thomas L.: *See*—
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Wakeman, Thomas G.: *See*—
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Wakou, Iichi: *See*—
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Walba, David: *See*—
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Walck, Scott N.: *See*—
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Dierenbach, Karl; Jacoby, Elliot G., Jr.; Snavely, Dan A.; Tucker, Darryl W.; Walck, Scott N.; and Walck, Scott N., 5,180,886, Cl. 174-66.000.

Waldman, Gary: *See*—
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Walker, Douglas G.: *See*—
Close, Richard C.; Gregory, H. Scott, Jr.; and Walker, Douglas G., 5,181,124, Cl. 358-300.000.

Walker, Herman B., to Koppy Corporation. Splined assembly. 5,180,043, Cl. 192-70.200.

Walker, William H.; and Braswell, Kenneth. Decorative trimming system. 5,179,811, Cl. 52-287.000.

Wall, Monroe E.; Wani, Mansukh C.; Nicholas, Allan W.; and Manikumar, Govindarajan, to Research Triangle Institute. 10,11-methylenedioxy-20(RS)-camptothecin and 10,11-methylenedioxy-20(S)-camptothecin analogs. 5,180,722, Cl. 514-219.000.

Wallac Oy: *See*—
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Walley, Darlene R.: *See*—
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Walser, Robert A.; and Rydell, Earl E., to FMC Corporation. Ring bus station having dual oscillators. 5,181,202, Cl. 370-85.150.

Walsh, Bruce: *See*—
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Wand, Michael; Vohra, Rohini; and Walba, David, to University Research Corporation. Ferroelectric liquid crystal compositions containing halogenated cores and chiral halogenated cores and chiral haloalkoxy tail units. 5,180,520, Cl. 252-299.610.

Wang, Jiann-Kwang: *See*—
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Wang, Jiunn Y.: *See*—
Yeh, Edge C.; and Wang, Jiunn Y., 5,180,214, Cl. 303-111.000.

Wang, Mansheng; and Given, Bruce A., to TRW Inc. Ceramic aluminum laminate and thermally conductive adhesive therefor. 5,180,625, Cl. 428-212.000.

Wang, Mao-Hsiung, to Cheeng Iu Industrial Co., Ltd. Steering wheel lock for automobile. 5,179,849, Cl. 70-209.000.

Wang, Pei-Jan: *See*—
Liu, Hsien-Tsung; Lee, Jin-Yuan; Wang, Jiann-Kwang; Yoo, Chue-San; and Wang, Pei-Jan, 5,180,689, Cl. 437-228.000.

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Warm, Aleksander: *See*—
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Warner, John L., to United Technologies Corp. Surge-tolerant compression system. 5,180,278, Cl. 415-27.000.

Warner-Lambert Company: *See*—
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Washizu, Shintaro: *See*—
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Watanabe, Isao; Rensel, John D.; and Weitzenhof, David A., to Bridgestone Corporation. Vibration damping device. 5,180,145, Cl. 267-64.240.

Watanabe, Kazuo; Tuchida, Toshio; and Schultz, Duane R., to Xonex Laboratories, Inc.; and Toyobo Co., Ltd. Anti-inflammatory and analgesic compounds, related compositions and methods for preparation and use thereof. 5,180,743, Cl. 514-565.000.

Watanabe, Naotaka: *See*—
Akune, Kenichi; Watanabe, Naotaka; Inomiya, Yukihiro; Itoda, Hiroshi; Arai, Takeo; and Funato, Reiko, 5,180,473, Cl. 162-168.200.

Watanabe, Toshiro: *See*—
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Watanabe, Yoshio: *See*—
Kai, Junichi; Yasuda, Hiroshi; and Watanabe, Yoshio, 5,180,920, Cl. 250-492.200.

Watanabe, Yukio: *See*—
Ishikawa, Masayuki; Okuda, Hajime; Shiozawa, Hideo; Itaya, Kazuhiko; Watanabe, Yukio; Suzuki, Mariko; and Hatakoshi, Genichi, 5,181,218, Cl. 372-45.000.

Watchorn, Ernest W., to Confloat Consulting Ltd. Concrete pump having pressurized seal for swing tube. 5,180,294, Cl. 417-516.000.

Waters, John L.: *See*—
Bryant, Frank R.; and Waters, John L., 5,180,688, Cl. 437-195.000.

Watkins, Joseph J.: *See*—
Bagrodia, Shriram; Fagerburg, David R.; Gedon, Steven; Watkins, Joseph J.; Lawrence, Paul B.; and Rule, Mark, 5,180,775, Cl. 525-64.000.

Wayne State University: *See*—
States, J. Christopher; Hines, Ronald N.; and Novak, Raymond F., 5,180,666, Cl. 435-29.000.

WEA Manufacturing, Inc.: *See*—
Suhan, John M., 5,181,081, Cl. 356-394.000.

Weaver, Roger. Pipe cutting apparatus. 5,179,781, Cl. 30-92.000.

Weber-Knapp Company: *See*—
Sova, Alan, 5,180,136, Cl. 248-576.000.

Weber, Roy P.: *See*—
Medamana, John B.; Palmer, John W.; and Weber, Roy P., 5,181,238, Cl. 379-95.000.

Wegerer, Tanja: *See*—
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Wehner, Winfried: *See*—
Birkhan, Horst; Kohle, Hans-Juergen; Weigand, Joachim; and Wehner, Winfried, 5,180,508, Cl. 252-8.800.

Wei, Wu-Yaw: *See*—
Yeh, Bean-Shung; Wei, Wu-Yaw; Su, Bean-Horng; and Wu, Lin-Yun, 5,180,025, Cl. 180-65.500.
Weidner, Hans-Jurgen: *See*—
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Weigand, Joachim: *See*—
Birkhan, Horst; Kohle, Hans-Juergen; Weigand, Joachim; and Wehner, Winfried, 5,180,508, Cl. 252-8.800.
Weise, Lutz; Fennel, Helmut; and Wupper, Hans, to Alfred Teves GmbH. Brake system for automotive vehicles with electronically controlled brake force distribution and with anti-lock control. 5,180,211, Cl. 303-9.630.
Weiss, Andre : *See*—
Vatant, Robert A.; Courbier, Michel F.; and Weiss, Andre , 5,180,538, Cl. 266-91.000.
Weiss, Douglas J.; Cretzmeyer, John W.; Crespi, Ann M.; Howard, William G.; and Skarstad, Paul M., to Medtronic, Inc. Electrochemical cells with end-of-service indicator. 5,180,642, Cl. 429-90.000.
Weiss, Steven M., to Telectronics Pacing Systems, Inc. Apparatus and method for arrhythmia detection by variations in the transcardiac impedance between defibrillation patches. 5,179,946, Cl. 128-419.00D.
Weiss, Werner; Mair, Manfred; Deisenhofer, Manfred; and Poesl, Ewald, to Patent Treuhand Gesellschaft fur Elektrische Gluhlampen m.b.H. Lead oxide-free glass, particularly for use in electric lamps. 5,180,695, Cl. 501-66.000.
Weissing, Dave: *See*—
Hanson, Gunnar J.; Baran, John S.; Weissing, Dave; and Russell, Mark, 5,180,725, Cl. 514-249.000.
Hanson, Gunnar J.; Baran, John S.; Weissing, Dave; and Russell, Mark, 5,180,744, Cl. 514-616.000.
Weisskopf, Klaus: *See*—
Vigneault, Richard E.; Wagner, William S.; Weisskopf, Klaus; Williamson, R. Edward; and Woodward, A. John, 5,180,793, Cl. 525-446.000.
Weitzenhof, David A.: *See*—
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Weiu, Tai S.: *See*—
Durand, David; Vieau, David P.; Chu, Ang-Ling; and Weiu, Tai S., 5,180,523, Cl. 252-512.000.
Wendt, Rolf H. G., to NEC America Inc. DC-to-AC symmetrical sine wave generator. 5,180,987, Cl. 328-14.000.
Wengrovius, Jeffrey H.; and Van Valkenburgh, Virginia M., to General Electric Company. Heat curable epoxy compositions. 5,180,801, Cl. 528-15.000.
Wenholz, Bruce; Gault, R. H.; and Jones, Kerry A., to Baker Hughes Incorporated. Air balance control for a pumping unit. 5,180,289, Cl. 417-53.000.
Weniger, Rudi: *See*—
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Wenzel, Donna J.: *See*—
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Wescor, Inc.: *See*—
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West Electric Co., Ltd.: *See*—
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Westcott, Michael J.: *See*—
Christian, Donald J.; Robertson, Graham D.; Tucci, James M.; and Westcott, Michael J., 5,180,122, Cl. 244-134.00F.
Westeppe, Uwe: *See*—
Lutjens, Holger; Westeppe, Uwe; Piejko, Karl-Erwin; and Lindner, Christian, 5,180,781, Cl. 525-148.000.
Westerdale, Norman R. Adjustable chain vehicle tie-down apparatus. 5,180,262, Cl. 410-12.000.
Western Company of North America, The: *See*—
Stout, Gregg W.; and Matte, James T., 5,180,010, Cl. 166-212.000.
Westinghouse Electric Corp.: *See*—
Conway, Lawrence E.; and Schulz, Terry L., 5,180,543, Cl. 376-282.000.
Gehrs, Donald F.; and Runge, Louis L., 5,181,165, Cl. 361-355.000.
Lau, Sai K., 5,180,285, Cl. 416-241.00B.
Miler, Robert L.; and Abramovitz, Irwin J., 5,181,036, Cl. 342-15.000.
Schweizer, Philipp F.; and Petlevich, Walter J., Jr., 5,181,254, Cl. 382-1.000.
Sparrow, James A.; and Cantrell, Robert W., 5,180,549, Cl. 376-445.000.
Tyler, Paul J., 5,180,923, Cl. 290-40.00C.
Westvaco Corporation: *See*— .
Hutter, G. Frederick, 5,180,424, Cl. 106-20.00R.
LeVine, Joseph W., 5,180,774, Cl. 525-54.440.
Wettlaufer, David G.; Shutske, Gregory M.; and Nemoto, Peter A., to Hoechst-Roussel Pharmaceuticals Incorporated. 6,7-dihydro-3-phenyl-1,2-benzisoxazol-4(5h)-ones. 5,180,834, Cl. 548-241.000.
Wetzel, Gerhard: *See*—
Bernhardt, Wolfgang; Holzmann, Roland; Schmidt, Guenther; Kirstein, Lothar; and Wetzel, Gerhard, 5,180,215, Cl. 303-113.200.
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White, Danny R.: *See*—
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White, Gene J.: *See*—
Hyde, Glenn F.; and White, Gene J., 5,180,448, Cl. 148-525.000.
White, George, to Du Pont Canada, Inc. Method of lining of metallic pipe using a plurality of concentric flexible tubes of thermoplastic polymer. 5,180,458, Cl. 156-87.000.
White, Ronald E.; and Demuth, Thomas P., Jr., to Norwich Eaton Pharmaceuticals, Inc. Antimicrobial quinolonyl lactam esters. 5,180,719, Cl. 514-192.000.
White, William D.: *See*—
Townsend, Daniel R.; and White, William D., 5,181,051, Cl. 351-52.000.
Whitfill, Donald L.: *See*—
Fuh, Giin-Fa; Morita, Nobuo; Whitfill, Donald L.; and Strah, David A., 5,180,020, Cl. 175-72.000.
Whiting, Frederick J.: *See*—
Simms, Tammy J.; and Whiting, Frederick J., 5,179,978, Cl. 137-625.460.
Whittaker, Mark; Miller, Andrew; and Bowles, Stephen A., to British Bio-Technology Limited. Certain sulfonamide heterobicyclic platelet activating factor antagonists. 5,180,723, Cl. 514-234.200.
Whittaker, Mark: *See*—
Bowles, Stephen A.; Whittaker, Mark; and Miller, Andrew, 5,180,724, Cl. 514-248.000.
Whitten, Ronald G., to Teleco Oilfield Services Inc. Method for predicting drillstring sticking. 5,181,172, Cl. 364-422.000.
Wickel, Stefan: *See*—
Niessner, Manfred; Beck, Juergen; Hartmann, Heinrich; Kemna, Andreas H.; and Wickel, Stefan, 5,180,804, Cl. 528-500.000.
Wicker, Guy C.: *See*—
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Widder, Kenneth J.: *See*—
Levene, Harold B.; Barnhart, James L.; and Widder, Kenneth J., 5,179,955, Cl. 128-662.020.
Widmann, Werner, to Karl Widmann Schweissmaschinen GmbH. Apparatus to apply reinforcements on filing guides or inserts, and method. 5,180,461, Cl. 156-216.000.
Wiedeck, Hans N., to Krupp Industrietechnik GmbH. Vehicle for laying dismountable bridges. 5,179,751, Cl. 14-2.400.
Wiedenmann, Hans-Martin: *See*—
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Wiedersatz, John: *See*—
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Wiese, David, to Hi-Shear Corporation. Self locking nut. 5,180,265, Cl. 411-150.000.
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Wilcox, John P.: *See*—
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Willems, David A., to ITT Corporation. Switched transmission line phase shifter apparatus employing multiple jets. 5,180,998, Cl. 333-164.000.
Williams, Doil: *See*—
Reindl, Wilhelm; and Williams, Doil, 5,180,704, Cl. 502-402.000.
Williams, Linda K.: *See*—
Smith, Terrance P.; Macomber, David W.; Chang, Jeffrey C.; and Williams, Linda K., 5,180,705, Cl. 503-227.000.
Williams, Marguerite R. Reversible mastectomy brassiere. 5,180,326, Cl. 450-91.000.
Williams, Michael, to CAS Medical Systems, Inc. Blood pressure cuff and hose fitting therefor. 5,179,957, Cl. 128-686.000.
Williamson, R. Edward: *See*—
Vigneault, Richard E.; Wagner, William S.; Weisskopf, Klaus; Williamson, R. Edward; and Woodward, A. John, 5,180,793, Cl. 525-446.000.
Willis, John W.: *See*—
Rada, Mark Z.; Willis, John W.; Eade, John A.; and Kidwell, Charles E., 5,180,050, Cl. 200-329.000.
Wilson, Gary. Recyclable oil change apparatus. 5,180,033, Cl. 184-1.500.
Wilson, Geoffrey G.; and Nwankwo, Donald, to New England Biolabs, Inc. Cloning restriction and modification genes. 5,180,673, Cl. 435-199.000.
Wilson, Susan L.: *See*—
Landi, Curtis L.; and Wilson, Susan L., 5,180,619, Cl. 428-116.000.
Winston, Anthony E.; Miskewitz, Regina M.; Walley, Darlene R.; and Berschied, John R., to Church & Dwight Co., Inc. Anticalculus dentifrices. 5,180,576, Cl. 424-52.000.
Winterer, Martin: *See*—
Flamm, Peter; Winterer, Martin; and Desor, Hans-Juergen, 5,181,115, Cl. 358-158.000.
Wintersteen, Douglas C.; Hamilton, Lynn R.; Mikesell, Donald E.; and Sheets, Gerald R., to General Motors Corporation. Universal seamless receiver-dehydrator assembly for an automotive air conditioning system. 5,179,780, Cl. 29-890.070.

Winsching, Randolph C.: *See*—
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Wirth, Georg: *See*—
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Wisconsin Alumni Research Foundation: *See*—
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Wisnasky, Donald, to D & S Manufacturing Co. Vacuum cleaner. 5,179,762, Cl. 15-314.000.
Wittmann, Jean C.: *See*—
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Wittrisch, Christian, to Institut Francais du Petrole. Method and device for carrying out measuring operations of interventions in a well. 5,180,011, Cl. 166-250.000.
Wojciechowski, Jurgen: *See*—
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Wojnicki, John. Apparatus for automatically forming, filling, sealing and separating film packaging from a film webbing. 5,179,816, Cl. 53-133.400.
Wolfer, Peter: *See*—
Sonderegger, Hans; Kuratle, Rolf; and Wolfer, Peter, 5,179,857, Cl. 73-117.300.
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Wong, Chung-Wah F.: *See*—
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Wong, Shaio-wen: *See*—
Edenbaum, Martin; Frisch, Kurt C.; Sendijarevic, Aisa; and Wong, Shaio-wen, 5,180,632, Cl. 428-253.000.
Woods, W. T. Apparatus and method for angioplasty and for preventing re-stenosis. 5,180,366, Cl. 604-96.000.
Woods, William G., to United States Borax & Chemical Corporation. Stabilized liquid persalt bleach compositions. 5,180,517, Cl. 252-186.270.
Woodward, A. John: *See*—
Vigneault, Richard E.; Wagner, William S.; Weiskopf, Klaus; Williamson, R. Edward; and Woodward, A. John, 5,180,793, Cl. 525-446.000.
Wootton, John R.; and Waldman, Gary, to Electronics & Space Corp. Beam steered laser for fire control. 5,180,881, Cl. 89-41.190.
Worden, Donald F.: *See*—
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World-Wide Stationery Manufacturing Co. Ltd.: *See*—
Yu, Cheng H., 5,180,247, Cl. 402-41.000.
Worner, Siegfried; Wirth, Georg; and Zacke, Peter, to J. Eberspacher. Device for treating the exhaust gases of internal combustin engines with two exhaust gas treatment bodies arranged at spaced locations. 5,180,408, Cl. 55-482.000.
Worsfold, Jonathan P., to BOC Group plc, The. Cryogenic treatment methods. 5,179,840, Cl. 62-64.000.
Worst, J. G. F. Gonio seton. 5,180,362, Cl. 604-8.000.
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Wraight, Peter D., to Schlumberger Technology Corporation. Self-calibrating proportional counter. 5,180,917, Cl. 250-374.000.
Wright, Joe W.: *See*—
Given, Michael S.; and Wright, Joe W., 5,180,149, Cl. 267-180.000.
Wu, An-hsiang, to Phillips Petroleum Company. Synthesis of phosphinoacetic acids. 5,180,848, Cl. 562-405.000.
Wu, Chuan-Chin. Waste-receiving plate for chicken cages. 5,179,912, Cl. 119-22.000.
Wu, Chung-You C.: *See*—
Natwick, Vernon R.; Lawless, Michael W.; Doll, Joseph E.; and Wu, Chung-You C., 5,180,287, Cl. 417-43.000.
Wu, Lin-Yun: *See*—
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Wupper, Hans: *See*—
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Wusthof, Peter; and Cunningham, Sinclair, to Mannesmann Rexroth GmbH. Radial piston engine. 5,179,889, Cl. 91-491.000.
Wysk, S. Ronald: *See*—
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Xandopulo, Georgy I.: *See*—
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Xerox Corporation: *See*—
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Yabuuchi, Katuya: *See*—
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Yachigo, Shinichi: *See*—
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Yager, Carl W.: *See*—
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Yagi Antenna Co., Ltd.: *See*—
Kaise, Atsushi; Hirohara, Naoya; Kasahara, Hiroshi; Wakou, Iichi; and Kaneko, Yoichi, 5,181,042, Cl. 343-700.0MS.
Yagi, Kazuo: *See*—
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Yagi, Tetsuya, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor light emitting light concentration device. 5,181,220, Cl. 372-45.000.
Yahagi, Toshio: *See*—
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Yajima, Takahisa: *See*—
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Yaksh, Tony L.; and Hill, Harlan F., to University of California, The Regents of the. Cyclodextrin complexes for neuraxial administration of drugs. 5,180,716, Cl. 514-58.000.
Yamada, Hideaki: *See*—
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Yamada, Jin: *See*—
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Yamada, Katsuhiko: *See*—
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Yamada, Kazuhiro: *See*—
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Yamada, Shu, to Kabushiki Kaisha Toshiba. Method of manufacturing card. 5,180,906, Cl. 235-487.000.
Yamada, Toshihiro: *See*—
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Yamaguchi, Akira: *See*—
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Yamaguchi, Jun; Ishige, Sadao; Sato, Kozo; Washizu, Shintaro; and Itoh, Isamu, to Fuji Photo Film Co., Ltd. Light- and heat-sensitive composition, and recording material. 5,180,652, Cl. 430-281.000.
Yamaguchi, Makoto; Hake, John; Okamura, Kazuo; and Minami, Kiyoshi, to Shimizu Construction Co., Ltd. Method of controlling waste water treatment by anaerobic fermentation. 5,180,494, Cl. 210-603.000.
Yamaguchi, Toru; Inazuki, Yukio; and Nakazawa, Hideo, to Ishikawajima-Harima Heavy Industries Co., Ltd. Method of detecting the presence of moisture in a gas. 5,180,554, Cl. 422-86.000.
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Yamakawa, Tomio: *See*—
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Yamamoto, Katumoto: *See*—
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Yamamoto, Masashi: *See*—
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Yamamoto, Michihiro: *See*—
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Yamamoto, Osamu; and Kawanishi, Hidenori, to Sharp Kabushiki Kaisha. Method for the production of a semiconductor laser device. 5,180,685, Cl. 437-129.000.
Yamamoto, Osamu: *See*—
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Yamamoto, Takashi: *See*—
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Yamamoto, Toshio; and Sawada, Koji, to Dainippon Screen Mfg. Co., Ltd. Manufacturing process of shadow mask and shadow mask plate therefor. 5,180,322, Cl. 445-37.000.
Yamamoto, Yasuhiro: *See*—
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Yamano, Yoshiaki: *See*—
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Yamanouchi Pharmaceutical Co., Ltd.: *See*—
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Yamaoka, Fumiyuki; Sasaki, Mitsuo; Nakazawa, Chiharu; and Sugiyama, Hiroyuki, to Atsugi Unisia Corporation. Suspension strut construction. 5,180,129, Cl. 248-230.000.
Yamaoka, Ikuro; and Kimura, Masao, to Nippon Steel Corporation. Injection molding of styrene resin. 5,180,535, Cl. 264-328.160.
Yamashita, Masami; Iwato, Noboru; Mine, Hideki; and Toshiaki, Wada, to Sumitomo Special Metals Co., Ltd.; and Denki Kagaku Dogyo Kabushiki Kaisha. Thin-film perpendicular magnetic recording and reproducing head having thin magnetic shield film on side surfaces. 5,181,151, Cl. 360-126.000.
Yamashita, Mitugu; Kawamoto, Mutsumi; and Inagaki, Hidemitsu, to Aisin AW Co., Ltd. Wheel supporting apparatus. 5,180,180, Cl. 280-96.000.
Yamashita, Shigeo, to Mitsubishi Denki K.K. Electromagnetic solenoid valve. 5,181,003, Cl. 335-282.000.
Yamashita, Tsutomu T.; Nguyen, Phuong; and Chen, Tu, to Komag, Inc. Magnetic recording medium comprising a magnetic alloy layer of cobalt nickel, platinum and chromium formed directly on a nickel alloy amorphous underlayer. 5,180,640, Cl. 428-611.000.
Yamauchi, Satomi: *See*—
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Yamauchi, Yoshimitsu; Tanaka, Kenichi; Sakiyama, Keizo; and Fukumoto, Katsumi, to Sharp Kabushiki Kaisha. Semiconductor memory device. 5,181,188, Cl. 365-228.000.
Yamauchi, Yoshio: *See*—
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Yamazaki, Seiichi, to Oki Electric Industry Co., Ltd. Constant-current source circuit having a MOS transistor passing off-heat current. 5,180,967, Cl. 323-315.000.
Yamazaki, Shunpei; and Mase, Akira, to Semiconductor Energy Laboratory Co., Ltd. Power conserving driver circuit for liquid crystal displays. 5,181,131, Cl. 359-56.000.
Yamazaki, Tetsuhiro: *See*—
Ohyama, Minoru; Yamazaki, Tetsuhiro; Inoue, Hiroshi; and Konno, Toshio, 5,180,909, Cl. 250-216.000.
Yamazaki, Toshiaki: *See*—
Kiyohara, Kazuto; Araki, Hiromitsu; Yamazaki, Toshiaki; and Harada, Ichiya, 5,180,658, Cl. 430-533.000.
Yamazaki, Toshimasa: *See*—
Harada, Chikao; Kawamura, Norio; Nakashima, Ryuji; Takahashi, Arihiro; Yamazaki, Toshimasa; Yasui, Masanobu; and Kondo, Tatsushi, 5,179,956, Cl. 128-672.000.
Yan, Ying D.; Bortins, John; Keel, Beat G.; and Amin, Nurul, to Seagate Technology Inc. Leading edge undershoot elimination in thin film heads. 5,181,152, Cl. 360-126.000.
Yanagida, Katsuro; and Hayashizaki, Yoshikatsu, to Kaijo Corporation. Wire bonder with bonding arm angle sensor. 5,180,094, Cl. 228-4.500.
Yanagimoto, Hiroaki: *See*—
Arima, Yukio; Yanagimoto, Hiroaki; Kunitomo, Yuichi; and Tominaga, Tetsuyoshi, 5,179,954, Cl. 128-660.070.
Yanay, Shaul: *See*—
Shorr, Leonard M.; Fishler, Theodor M.; Yanay, Shaul; and Rumack, Michael, 5,180,787, Cl. 525-282.000.
Yancopoulos, George: *See*—
Barde, Yves-Alain; Leibrock, Joachim; Lottspeich, Friedrich; Yancopoulos, George; and Thoenen, Hans, 5,180,820, Cl. 536-23.510.
Yang, Ming-Tzong, to United Microelectronics Corporation. Method of fabricating electrically erasable read only memory cell. 5,180,680, Cl. 437-38.000.
Yano, Kohsaku: *See*—
Ueda, Tetsuya; Suzuki, Naoki; and Yano, Kohsaku, 5,180,436, Cl. 118-723.000.
Yarlett, Nigel: *See*—
Sufrin, Janice R.; Bacchi, Cyrus J.; Porter, Carl W.; Nathan, Henry; Spiess, Arthur J.; and Yarlett, Nigel, 5,180,714, Cl. 514-46.000.
Yassa, Fathy F.; and Garverick, Steven L., to General Electric Company. Digital filter for filtering and decimating delta sigma modulator output signals. 5,181,033, Cl. 341-143.000.
Yasuda, Hironori; Yamamoto, Katumoto; and Yoshida, Osamu, to Howa Machinery, Ltd. Unit driving mechanism of spindles in a spinning frame. 5,179,826, Cl. 57-104.000.
Yasuda, Hiroshi: *See*—
Kai, Junichi; Yasuda, Hiroshi; and Watanabe, Yoshio, 5,180,920, Cl. 250-492.200.
Oae, Yoshihisa; Sakamoto, Kiichi; and Yasuda, Hiroshi, 5,180,919, Cl. 250-492.200.
Yasuda, Masashi: *See*—
Choshitani, Hitoshi; Osaka, Takahide; Itojima, Fumiaki; and Yasuda, Masashi, 5,180,958, Cl. 318-623.000.
Yasuda, Shuhei: *See*—
Matsumoto, Toshio; Yasuda, Shuhei; Kusada, Tokutarou; and Nagashima, Nobuyoshi, 5,181,121, Cl. 358-236.000.
Yasuhara, Mitsuki: *See*—
Matsunaga, Fujihisa; Fukuhara, Hiroshi; and Yasuhara, Mitsuki, 5,180,871, Cl. 585-400.000.
Yasui, Masanobu: *See*—
Harada, Chikao; Kawamura, Norio; Nakashima, Ryuji; Takahashi, Arihiro; Yamazaki, Toshimasa; Yasui, Masanobu; and Kondo, Tatsushi, 5,179,956, Cl. 128-672.000.
Yasunaga, Kuniaki; and Ueno, Shigeru, to Bridgestone Corporation. Method for producing antistatic polyurethane resin. 5,180,755, Cl. 521-116.000.
Yazaki Corporation: *See*—
Furuya, Yoshiyuki; Iino, Tadashi; and Aoki, Kunimitsu, 5,181,012, Cl. 340-461.000.
Yazawa, Yoshiyuki: *See*—
Matsui, Toshitaka; Torisawa, Nobuyuki; and Yazawa, Yoshiyuki, 5,180,156, Cl. 271-103.000.
Yeh, Bean-Shung; Wei, Wu-Yaw; Su, Bean-Horng; and Wu, Lin-Yun. Wheeled-chair chassis with a suspension mechanism. 5,180,025, Cl. 180-65.500.
Yeh, Edge C.; and Wang, Jiunn Y., to National Science Council. Servo-type phase-locked loop anti-skid brake control system. 5,180,214, Cl. 303-111.000.
Yeowart, Richard J.: *See*—
Clough, Peter S.; Yeowart, Richard J.; and Moore, Mansel, 5,179,752, Cl. 14-73.000.
Yerly, Marcel, to Bobst SA. Process for controlling the parallelism of the two beams of a press used for cutting sheet or weblike matter destined to be converted into a package. 5,179,879, Cl. 83-34.000.
Yngve, Paul W.: *See*—
Tinsley, Otis B.; and Yngve, Paul W., 5,179,827, Cl. 57-204.000.
Yoda, Sumio; Futamura, Nobuyuki; Hashimoto, Matsuo; and Saiki, Yoshifumi, to Nippon Kayaku Kabushiki Kaisha. Resin compositions and process for forming transparent thin films. 5,180,794, Cl. 525-487.000.
Yoder, Brant. Apparatus and method for illuminating a liquid filled container. 5,180,221, Cl. 362-101.000.
Yokoyama, Hitoshi; Sawamura, Norio; and Motobayashi, Noriko, to Fuji Oil Co., Ltd. Method for ripening cheese under high pressure. 5,180,596, Cl. 426-36.000.
Yokoyama, Yoshihiro: *See*—
Kurosu, Yasuo; Yokoyama, Yoshihiro; Nishikawa, Kenichi; Masuzaki, Hidefumi; and Fujinawa, Masaaki, 5,181,260, Cl. 382-46.000.
Yoneda, Makoto: *See*—
Tsurutani, Kazushi; Hosogai, Daijiro; Kokubo, Kakuro; Kobayashi, Taiji; Higashimoto, Noboru; Endoh, Masami; Namiyama, Kazuyoshi; and Yoneda, Makoto, 5,179,923, Cl. 123-435.000.
Yoneyama, Yasuhiro: *See*—
Hosoya, Ikuo; and Yoneyama, Yasuhiro, 5,180,571, Cl. 423-446.000.
Yoneyama, Yoshito: *See*—
Touge, Yoshiyuki; and Yoneyama, Yoshito, 5,180,065, Cl. 209-577.000.
Yoo, Chue-San: *See*—
Liu, Hsien-Tsung; Lee, Jin-Yuan; Wang, Jiann-Kwang; Yoo, Chue-San; and Wang, Pei-Jan, 5,180,689, Cl. 437-228.000.
Yoon, Yung S.: *See*—
Moon, Seung H.; and Yoon, Yung S., 5,181,085, Cl. 257-94.000.
Yoshida, Kimihiko: *See*—
Yoshimoto, Masafumi; Nakatsuji, Tadao; and Yoshida, Kimihiko, 5,180,567, Cl. 423-239.000.
Yoshida, Naohito, to Mitsubishi Denki Kabushiki Kaisha. Strained superlattice semiconductor structure. 5,181,086, Cl. 257-18.000.
Yoshida, Osamu: *See*—
Yasuda, Hironori; Yamamoto, Katumoto; and Yoshida, Osamu, 5,179,826, Cl. 57-104.000.
Yoshida, Yoshikazu: *See*—
Okuda, Akira; and Yoshida, Yoshikazu, 5,180,433, Cl. 118-718.000.
Yoshimatsu, Toshikane: *See*—
Katsumata, Masao; Momata, Kazuhiro; Adachi, Kazuyoshi; Takeura, Tooru; Kitada, Masahiro; Kamo, Yoshihisa; and Yoshimatsu, Toshikane, 5,181,149, Cl. 360-119.000.
Yoshimoto, Masafumi; Nakatsuji, Tadao; and Yoshida, Kimihiko, to Sakai Chemical Industry Co., Ltd. Exhaust gas treating method. 5,180,567, Cl. 423-239.000.
Yoshino Kogyosho Co., Ltd.: *See*—
Iizuka, Shigeo, 5,180,245, Cl. 401-278.000.
Yoshino, Masanori: *See*—
Yoshino, Syoichi; Izaki, Hiroshi; Yoshino, Masanori; Kasai, Fumio; Tokunaga, Yosimitu; and Ishiki, Naotsugu, 5,180,539, Cl. 266-202.000.
Yoshino, Syoichi; Izaki, Hiroshi; Yoshino, Masanori; Kasai, Fumio; Tokunaga, Yosimitu; and Ishiki, Naotsugu, to Kubota Corporation. Method of and apparatus for producing metal powder. 5,180,539, Cl. 266-202.000.
Yoshioka, Ritsuo; Ueda, Makoto; Motora, Yuichi; and Nakamura, Mitsuharu, to Kabushiki Kaisha Toshiba. Control blade for nuclear reactor. 5,180,544, Cl. 376-333.000.
Yoshizaki, Satoshi: *See*—
Honbo, Yoichi; Yoshizaki, Satoshi; and Iwasaki, Motohiro, 5,180,457, Cl. 152-541.000.
You, Young S.: *See*—
Matrick, Howard; Shepard, Michele E.; and You, Young S., 5,180,425, Cl. 106-22.00R.
Young, James E.; McManigill, Douglass; and Lux, Jurgen A., to Hewlett-Packard Company. System and method for controlling electroosmotic flow. 5,180,475, Cl. 204-180.100.

Young, Robert H. Self draining door sill assembly. 5,179,804, Cl. 49-471.000.

Yrjonen, Tapio: *See*—
Lehtinen, Kauko; Oikari, Timo; and Yrjonen, Tapio, 5,180,916, Cl. 250-367.000.

Yu, Cheng H., to World-Wide Stationery Manufacturing Co. Ltd. Ring binder. 5,180,247, Cl. 402-41.000.

Yugen Kaisha Aoi Shoji: *See*—
Hama, Mamoru; Mitsuyoshi, Matao; and Hashimoto, Takahiro, 5,179,943, Cl. 128-368.000.

Yusa, Hiroshi: *See*—
Kukimoto, Tsutomu; Yusa, Hiroshi; Takiguchi, Tsuyoshi; Tomiyama, Koichi; and Kuwashima, Tetsuhito, 5,180,649, Cl. 430-106.600.

Zacke, Peter: *See*—
Worner, Siegfried; Wirth, Georg; and Zacke, Peter, 5,180,408, Cl. 55-482.000.

Zahn, Rudolf K.: *See*—
Muller, Werner E. G.; Zahn, Rudolf K.; and Eich, Eckart, 5,180,748, Cl. 514-691.000.

Zander, Johann; and Temburg, Josef, to Trutzschler GmbH & Co. KG. Method and apparatus for opening fiber bales along an inclined plane. 5,179,763, Cl. 19-80.00R.

Zarnoch, Kenneth P., to General Electric Company. Method of preparing polymer surfaces for subsequent plating thereon and improved metal-plated plastic articles made therefrom. 5,180,639, Cl. 428-412.000.

Zavatteri, Ignazio: *See*—
Lepori, Agostino; Zavatteri, Ignazio; and Cova, Mario, 5,180,770, Cl. 524-563.000.

Zaweski, Edward F.; and Culley, Scott A., to Ethyl Petroleum Additives, Inc. Antioxidant additive and lubricating oil containing same. 5,180,510, Cl. 252-47.000.

Zazzera, Andre C.: *See*—
LaVallee, James R.; Hilsenbeck, Jerry M.; Brown, James G.; Sumner, Roger A.; Zazzera, Andre C.; and Bailey, Dana A., 5,181,236, Cl. 379-67.000.

Zeiger, Heinz, to Bruker Analytische Messtechnik GmbH. Probehead for a nuclear magnetic resonance spectrometer. 5,180,982, Cl. 324-322.000.

Zenith Electronics Corporation: *See*—
Citta, Richard W.; Halozan, Scott F.; and Sgrignoli, Gary J., 5,181,112, Cl. 358-141.000.

Zenshi, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Method of mounting an electronic part onto a printed circuit board. 5,180,097, Cl. 228-180.200.

Zexel Corporation: *See*—
Okano, Masami, 5,181,011, Cl. 340-438.000.

Ziebarth, Michael S.; Hager, Michael J.; Beeckman, Jean W.; and Plecha, Stanislaw, to W. R. Grace & Co.-Conn. SOx/NOx sorbent and process of use. 5,180,703, Cl. 502-243.000.

Zink, Robert C. Pillow radio apparatus. 5,179,747, Cl. 5-639.000.

Zobel, Jean-Claude: *See*—
Darchy, Francois; and Zobel, Jean-Claude, 5,180,414, Cl. 504-206.000.

Zoccarato, Walter; Bernard, Theron; and Barbaste, Regis, to Alcatel Espace. Multipactor effect measurement device using phase noise. 5,180,985, Cl. 324-613.000.

Zollinger, Hans, to Sulzer Brothers Limited. Rapier loom with inclined tape guide. 5,179,979, Cl. 139-449.000.

Zufle, T. Tyler. Soft body armor. 5,180,880, Cl. 89-36.020.

Zuk, Robert F.: *See*—
Ghazarossian, Vartan; Kung, Viola T.; and Zuk, Robert F., 5,180,828, Cl. 546-37.000.

Zushi, Toshihiro: *See*—
Morita, Yukio; Zushi, Toshihiro; Matsuda, Nobuyoshi; Suga, Kaneharu; and Takai, Takuma, 5,180,754, Cl. 521-85.000.

Zwicky, Paul: *See*—
Schultheiss, Roger; and Zwicky, Paul, 5,181,251, Cl. 381-96.000.

Zyskind, John L.: *See*—
Chung, Yun C.; DiGiovanni, David J.; Stone, Julian; Sulhoff, James W.; and Zyskind, John L., 5,181,210, Cl. 372-6.000.

7L Corporation: *See*—
Douglas, Jerry A.; and Pfitzinger, Walter R., 5,180,090, Cl. 225-42.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF JANUARY, 1993

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aluminum Company of America: *See*—
Miara, Chanakya, Re. 34,164, Cl. 423-115.000.

Aubrey, David R.; and Jameson, Ian, to Electricity Association Services Limited. Symmetrical fault current detector. Re. 34,163, Cl. 361-93.000.

Audhya, Tapan: *See*—
Goldstein, Gideon; Heavner, George; Kroon, Daniel; and Audhya, Tapan, Re. 34,165, Cl. 514-17.000.

Boyd, George P., Jr., to Zoltek Corporation. Controlled surface electrical resistance carbon fiber sheet product. Re. 34,162, Cl. 162-138.000.

Electricity Association Services Limited: *See*—
Aubrey, David R.; and Jameson, Ian, Re. 34,163, Cl. 361-93.000.

Goldstein, Gideon; Heavner, George; Kroon, Daniel; and Audhya, Tapan, to Ortho Pharmaceutical Corporation. Potent thymopentin analogs. Re. 34,165, Cl. 514-17.000.

Heavner, George: *See*—
Goldstein, Gideon; Heavner, George; Kroon, Daniel; and Audhya, Tapan, Re. 34,165, Cl. 514-17.000.

Jameson, Ian: *See*—
Aubrey, David R.; and Jameson, Ian, Re. 34,163, Cl. 361-93.000.

Kroon, Daniel: *See*—
Goldstein, Gideon; Heavner, George; Kroon, Daniel; and Audhya, Tapan, Re. 34,165, Cl. 514-17.000.

Miara, Chanakya, to Aluminum Company of America. Synthetic hydrotalcite. Re. 34,164, Cl. 423-115.000.

Ortho Pharmaceutical Corporation: *See*—
Goldstein, Gideon; Heavner, George; Kroon, Daniel; and Audhya, Tapan, Re. 34,165, Cl. 514-17.000.

Zoltek Corporation: *See*—
Boyd, George P., Jr., Re. 34,162, Cl. 162-138.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bass, Alan S.; Schenck, Stephen R.; and Martin, Robert C., to Texas Instruments Incorporated. Translator circuit and method of operation. B1 5,027,014, 1-19-93, Cl. 307-475.000.

Bowen, John G.; and Hauser, Stephen G., to Cooper Companies, Inc., The. Soft contact lens disinfecting unit. B1 4,529,868, 1-19-93, Cl. 219-521.000.

Carter, John W., to Wise, Co., Inc., The. Adjustable vehicle seat. B1 8,298,986, 1-19-93, Cl. D6-356.000.

Cooper Companies, Inc., The: *See*—
Bowen, John G.; and Hauser, Stephen G., B1 4,529,868, Cl. 219-521.000.

Hauser, Stephen G.: *See*—
Bowen, John G.; and Hauser, Stephen G., B1 4,529,868, Cl. 219-521.000.

Lab, S.A.: *See*—
Tellini, Marco G.; and Pfoutz, Billy D., B1 4,770,674, Cl. 55-5.000.
Tellini, Marco G.; and Pfoutz, Billy D., B1 4,844,723, Cl. 55-106.000.

Lookholder, Theodore W., to Sealed Air Corporation. Prefabricated unitary package which when sealed and irradiated conforms closely to contents and becomes impact-absorbing. B1 4,193,499, 1-19-93, Cl. 206-524.000.

Martin, Robert C.: *See*—
Bass, Alan S.; Schenck, Stephen R.; and Martin, Robert C., B1 5,027,014, Cl. 307-475.000.

Pfoutz, Billy D.: *See*—
Tellini, Marco G.; and Pfoutz, Billy D., B1 4,770,674, Cl. 55-5.000.
Tellini, Marco G.; and Pfoutz, Billy D., B1 4,844,723, Cl. 55-106.000.

Schenck, Stephen R.: *See*—
Bass, Alan S.; Schenck, Stephen R.; and Martin, Robert C., B1 5,027,014, Cl. 307-475.000.

Sealed Air Corporation: *See*—
Lookholder, Theodore W., B1 4,193,499, Cl. 206-524.000.

Tellini, Marco G.; and Pfoutz, Billy D., to Lab, S.A. Gas conditioning for an electrostatic precipitator. B1 4,770,674, 1-19-93, Cl. 55-5.000.

Tellini, Marco G.; and Pfoutz, Billy D., to Lab, S.A. Gas conditioning for an electrostatic precipitator. B1 4,844,723, 1-19-93, Cl. 55-106.000.

Texas Instruments Incorporated: *See*—
Bass, Alan S.; Schenck, Stephen R.; and Martin, Robert C., B1 5,027,014, Cl. 307-475.000.

Wise, Co., Inc., The: *See*—
Carter, John W., B1 8,298,986, Cl. D6-356.000.

LIST OF DESIGN PATENTEES

Abate, Jean T. Disposable helmet liner. 332,672, 1-19-93, Cl. D29-15.000.

Abe, Yuji: *See*—
Tanizawa, Akiyoshi; and Abe, Yuji, 332,606, Cl. D14-118.000.

Adolf, Raymond C., to Nation/Ruskin, Inc. Paint tray. 332,683, 1-19-93, Cl. D34-45.000.

Aker, Kevin R.; and Houry, Robert L., to Little Tikes Company, The. Workshop toy. 332,646, 1-19-93, Cl. D21-121.000.

Alford, Michael P., to Minka Lighting, Inc. Lighting fixture display stand. 332,534, 1-19-93, Cl. D6-469.000.

Alim, Sonia; Joffe, Richard M.; Liebler, Charles F.; McGarvey, John N.; and Rizzo, Joseph J., to AT&T Bell Laboratories. Telephone handset or similar article. 332,610, 1-19-93, Cl. D14-252.000.

Alliance Research Corporation: *See*—
Cooper, Gershon N., 332,609, Cl. D14-234.000.

Allied Metal Stamping Works: *See*—
Allred, Bobby J., 332,565, Cl. D8-354.000.

Allied Plastics, Ltd.: *See*—
Mankey, Neal N., 332,581, Cl. D11-121.000.

Allison Corporation: *See*—
Gerardiello, Joe; Seltzer, Samuel M.; Bryant, Ed; and Gage, John, 332,593, Cl. D12-155.000.

Allred, Bobby J., to Allied Metal Stamping Works. Drawer guide reinforcer bracket. 332,565, 1-19-93, Cl. D8-354.000.

American Safety Flight Systems, Inc.: *See*—
Miya, Tomio, 332,662, Cl. D24-164.000.

Anavil, Por; and Deeley, Julian M. H., to D.T.C. Industries Limited. Writing instrument. 332,627, 1-19-93, Cl. D19-49.000.

Andrus, Donald C.: *See*—
Gray, Larry R.; Slocum, Gerald F.; Andrus, Donald C.; and Edgell, James E., 332,524, Cl. D3-30.100.

Anthony's Manufacturing Company, Inc.: *See*—
Santosuosso, Joseph R., 332,564, Cl. D8-314.000.

APPA Technology Corporation: *See*—
Chang, Shang-Wen, 332,574, Cl. D10-78.000.

Apple Computer, Inc.: *See*—
Krakower, Jonathan; Ivester, Gavin R.; and Brunner, Robert D., 332,605, Cl. D14-106.000.

Argandona, Augusto; and Kelly, Michael B., to Fisher-Price, Inc. Toy trailer. 332,639, 1-19-93, Cl. D21-81.000.

AT&T Bell Laboratories: *See—*
Alim, Sonia; Joffe, Richard M.; Liebler, Charles F.; McGarvey, John N.; and Rizzo, Joseph J., 332,610, Cl. D14-252.000.

Atkinson, Robert W.; Laco, Michael J.; and Donizetti, William J., to Zimmer, Inc. Control unit for medical and surgical fluid delivery device or the like. 332,656, 1-19-93, Cl. D24-111.000.

Ausmedics Pty. Ltd.: *See—*
Sincock, Brian F., 332,664, Cl. D24-227.000.

Bamford, Russell. Oral regulated feeder. 332,657, 1-19-93, Cl. D24-117.000.

Barclay, John L.; and Elksnitis, John, to Barclay Recycling Inc. Compost container. 332,678, 1-19-93, Cl. D34-1.000.

Barclay Recycling Inc.: *See—*
Barclay, John L.; and Elksnitis, John, 332,678, Cl. D34-1.000.

Bell, Mace H., III: *See—*
Rawson, Paul O.; and Bell, Mace H., III, 332,660, Cl. D24-145.000.

Benson, Stephen P. Multiple compartment trash receptacle. 332,676, 1-19-93, Cl. D34-1.000.

Bisaga, Philip. Wetness indicating diaper. 332,659, 1-19-93, Cl. D24-126.000.

Blake, Jonathan D.; and Piucci, Vincent A., Jr., to Textron Inc. Ratchet spinner. 332,557, 1-19-93, Cl. D8-29.000.

Bobrick Washroom Equipment, Inc.: *See—*
Hines, David M., 332,542, Cl. D6-518.000.
Hines, David M., 332,679, Cl. D34-6.000.

Borg, Keith A. Child walking training device. 332,671, 1-19-93, Cl. D29-10.000.

Boss, Karen. Oil candle. 332,668, 1-19-93, Cl. D26-11.000.

Bowman, Willie M. Fishing tackle case. 332,526, 1-19-93, Cl. D3-38.000.

Brandoff, Norman H. Combined vest and heating element. 332,514, 1-19-93, Cl. D2-184.000.

Bremner, Mary. Flea trap. 332,649, 1-19-93, Cl. D22-122.000.

Brooks, Barry L. Ladder support. 332,667, 1-19-93, Cl. D25-68.000.

Brunner, Robert D.: *See—*
Krakower, Jonathan; Ivester, Gavin R.; and Brunner, Robert D., 332,605, Cl. D14-106.000.

Brussing, Bernd, to Hefendehl, Hans Friedrich. Surface-mountable holder for a plurality of desk trays. 332,628, 1-19-93, Cl. D19-65.000.

Brussing, Bernd, to Hefendehl, Hans Friedrich. Desk accessory holder. 332,630, 1-19-93, Cl. D19-77.000.

Bryant, Ed: *See—*
Gerardiello, Joe; Seltzer, Samuel M.; Bryant, Ed; and Gage, John, 332,593, Cl. D12-155.000.

C.E.P.A.D. Centro De Proyectos Avanzados De Diseno S.R.L.: *See—*
Marino, Mario H. S., 332,634, Cl. D21-20.000.

Camasi, Evelyn. Card holder. 332,632, 1-19-93, Cl. D19-90.000.

Canon Kabushiki Kaisha: *See—*
Matsumoto, Hidero, 332,619, Cl. D8-1.000.
Omino, Seiichi, 332,617, Cl. D18-1.000.
Omino, Seiichi, 332,618, Cl. D18-1.000.

Carley, Joseph C.: *See—*
Lytle, James R.; Cich, James J., Jr.; and Carley, Joseph C., 332,655, Cl. D23-378.000.

Chang, Shang-Wen, to APPA Technology Corporation. Clamp multimeter. 332,574, 1-19-93, Cl. D10-78.000.

Child Craft Industries, Inc.: *See—*
Williams, Keith, 332,541, Cl. D6-503.000.

Chu, William H. K. Calculator. 332,620, 1-19-93, Cl. D18-7.000.

Cich, James J., Jr.: *See—*
Lytle, James R.; Cich, James J., Jr.; and Carley, Joseph C., 332,655, Cl. D23-378.000.

Cole, Donald J. Game board. 332,636, 1-19-93, Cl. D21-31.000.

Combs, Mary A. Cradle. 332,532, 1-19-93, Cl. D6-385.000.

Contico International, Inc.: *See—*
Foster, Donald D.; and Laffey, Martin S., 332,652, Cl. D23-226.000.

Cooper, Gershon N., to Alliance Research Corporation. Cellular antenna. 332,609, 1-19-93, Cl. D14-234.000.

Cooper Industries, Inc.: *See—*
Snider, Phil A., 332,556, Cl. D8-14.100.

Corey, John L. Rope license plate frame. 332,596, 1-19-93, Cl. D12-193.000.

Cresden, David E., to Lawrence Paper Company, The. Molded dunnage for fluorescent tubes. 332,571, 1-19-93, Cl. D9-456.000.

Crook, Gregory M.; and Murphy, Kent W., to Rubbermaid Incorporated. Wall-mounted soap dish. 332,543, 1-19-93, Cl. D6-545.000.

D.T.C. Industries Limited: *See—*
Anavil, Por; and Deeley, Julian M. H., 332,627, Cl. D19-49.000.

Dalgleish, Martin J., to Linn Products Limited. Loudspeaker connector plug. 332,597, 1-19-93, Cl. D13-133.000.

Dallaire, Michel; Santella, Michael; and Swift, Michel, to 167848 Canada Inc. Ski retention post for maintaining pairs of skis in pressure retention contact across a pair of roof mounted ski racks. 332,594, 1-19-93, Cl. D12-157.000.

Deeley, Julian M. H.: *See—*
Anavil, Por; and Deeley, Julian M. H., 332,627, Cl. D19-49.000.

Devon Industries, Inc.: *See—*
Ramirez, Bruno J., 332,680, Cl. D34-7.000.

Dinand, Pierre, to Fox Fragrances S.r.l. Perfume bottle. 332,572, 1-19-93, Cl. D9-520.000.

Disston Company, The: *See—*
Gray, Larry R.; Slocum, Gerald F.; Andrus, Donald C.; and Edgell, James E., 332,524, Cl. D3-30.100.

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Fremont, Robert S.; and Wereley, Gary P., to Juno Lighting, Inc. Combined support clamp and electrical receptacle. 332,562, 1-19-93, Cl. D8-73.000.

Frost, John S.; Tanner, David P.; and Sitzema, Ronald L., Jr., to Siemens Solar Industries, L. P. Solar powered light with motion sensor. 332,669, 1-19-93, Cl. D26-63.000.

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Gibson, Dennis H. Inflatable distress balloon kit. 332,578, 1-19-93, Cl. D10-109.000.

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Hagerman, Oscar V. Gardening shovel. 332,555, 1-19-93, Cl. D8-10.000.

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Hatfield, Tinker; and Lozano, Sergio, to Nike, Inc.; and Nike International Ltd. Shoe sole bottom. 332,523, 1-19-93, Cl. D2-320.000.

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Hosoe, Isao, to 501 Itoki Co., Ltd. Table. 332,537, 1-19-93, Cl. D6-482.000.

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Johnson, John. Adjustable step-up box for exercise. 332,647, 1-19-93, Cl. D21-191.000.

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Klus, Kenneth F. Engine air intake vortex plate. 332,612, 1-19-93, Cl. D15-5.000.

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Knudsen, Jens N., to Interlego A.G. Element for a toy building set. 332,645, 1-19-93, Cl. D21-108.000.

Kohama, Mitsuyoshi; Kyogoku, Nobuyuki; and Yamaguchi, Seiji, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 332,588, 1-19-93, Cl. D12-110.000.

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Lucey, Robert E.; and Kelly, Robert M., to Unex Corporation. Electrical connector for a communication headset system. 332,601, 1-19-93, Cl. D13-147.000.

Lurkis, Jeffry L. Pair of bicycle handlebar grips. 332,563, 1-19-93, Cl. D8-303.000.

Lynch, C. Richard. Combined cup and plate holder. 332,552, 1-19-93, Cl. D7-619.000.

Lytle, James R.; Cich, James J., Jr.; and Carley, Joseph C., to Patton Electric Company, Inc. Portable electric fan. 332,655, 1-19-93, Cl. D23-378.000.

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Masagaki, Yoshihiro, to Sony Corporation. Combined microphone, speaker and amplifier. 332,608, 1-19-93, Cl. D14-226.000.

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Mayatt, Richard D. Straw. 332,548, 1-19-93, Cl. D7-300.200.

Maynerd, David; and King, Simon. Beverage container holder. 332,550, 1-19-93, Cl. D7-619.000.

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McFarland, James G. Hair curling iron support stand. 332,670, 1-19-93, Cl. D28-38.000.

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Middleton, Scott D., to Kix International, Inc. Adjustable double strap sandal. 332,516, 1-19-93, Cl. D2-290.000.
Middleton, Scott D., to Kix International, Inc. Toe strap sandal. 332,517, 1-19-93, Cl. D2-290.000.
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Omino, Seiichi, to Canon Kabushiki Kaisha. Electronic typewriter. 332,617, 1-19-93, Cl. D18-1.000.
Omino, Seiichi, to Canon Kabushiki Kaisha. Electronic typewriter. 332,618, 1-19-93, Cl. D18-1.000.
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Pagel, Kim, to Interlego A.G. Toy building element. 332,642, 1-19-93, Cl. D21-108.000.
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Ramirez, Bruno J., to Devon Industries, Inc. Sharps container. 332,680, 1-19-93, Cl. D34-7.000.
Randolph, Cleven E. Trailer hitch guide. 332,595, 1-19-93, Cl. D12-162.000.
Rawson, Paul O.; and Bell, Mace H., III, to United States Surgical Corporation. Surgical clip applier. 332,660, 1-19-93, Cl. D24-145.000.
Redfield, John M.; Rollins, David M.; Stocklin, Clay A.; Fukahara, Wayne R.; and Stack, Denis M., to Leviton Manufacturing Corporation. Electronic test set for telecommunications, alarm system, and circuit testing. 332,575, 1-19-93, Cl. D10-78.000.
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Rousseau, Xavier, to Societe Nouvelle Chaumet S.A. Jewelry chain. 332,580, 1-19-93, Cl. D11-12.000.
Rubbermaid Incorporated: *See—*
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Rumbles, Wayne A. Electrical control box. 332,603, 1-19-93, Cl. D13-184.000.
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S. Sugerman & Associates, Inc.: *See—*
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Shekell, Lawrence G. Measuring line spool housing for use in golf. 332,573, 1-19-93, Cl. D10-74.000.
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Siemens Solar Industries, L. P.: *See—*
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Sony Corporation: *See—*
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Yamazaki, Akira, 332,607, Cl. D14-210.000.

Staab, Donald A. Lawn and garden utility cart. 332,682, 1-19-93, Cl. D34-21.000.
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STC Corporation: *See*—
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Steiner, Robert L.; Holzner, Charles R.; and Voth, Allen J., to Steiner Company, Inc. Reservoir for a liquid soap dispenser. 332,544, 1-19-93, Cl. D6-545.000.
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Sugawara, Koki, to Oki Electric Industry Co., Ltd. Printer. 332,621, 1-19-93, Cl. D18-55.000.
Sugerman, Stanton H., to S. Sugerman & Associates, Inc. Combined line cutter and retractable needle. 332,651, 1-19-93, Cl. D22-149.000.
Sweeney, Paul B., Jr., to Welch Allyn, Inc. Spirometer base unit. 332,661, 1-19-93, Cl. D24-169.000.
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Szablak, Michael J.; and Tomblin, Glen E., to Rubbermaid Incorporated. Automobile desk. 332,527, 1-19-93, Cl. D3-40.000.
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Tanizawa, Akiyoshi; and Abe, Yuji, to Mita Industrial Co., Ltd. Facsimile machine. 332,606, 1-19-93, Cl. D14-118.000.
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Textron Inc.: *See*—
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Thompson, Charles P., to Plastic Engineered Products Company. Oral swab. 332,658, 1-19-93, Cl. D24-117.000.
Tikhonenko, Alexandr A. Internal combustion engine for technical models. 332,611, 1-19-93, Cl. D15-1.000.
Tiramani, Paolo; and Van Dyk, Thomas, to Goody Products, Inc. Handle for spray bottle. 332,570, 1-19-93, Cl. D9-434.000.
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Lucey, Robert E.; and Kelly, Robert M., 332,601, Cl. D13-147.000.
United States Surgical Corporation: *See*—
Rawson, Paul O.; and Bell, Mace H., III, 332,660, Cl. D24-145.000.
VanderVelden, Doreen M. Cushion insert for a baby crib. 332,545, 1-19-93, Cl. D6-596.000.
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Wada, Yoshihiro; Tamura, Takashi; and Hasegawa, Hiroshi, to Pentel Kabushiki Kaisha. Writing instrument. 332,626, 1-19-93, Cl. D19-48.000.
Waltner, Thomas E. Combined stadium bag and seat. 332,546, 1-19-93, Cl. D6-601.000.
Waterson, Rebecca L.; and Turek, John E., to Liberty Diversified Industries. Modular system of recyclable waste receptacles. 332,681, 1-19-93, Cl. D34-7.000.
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Wilkening, Steven R., to ODL, Incorporated. Door panel. 332,666, 1-19-93, Cl. D25-48.000.
Williams, Keith, to Child Craft Industries, Inc. End cap for a crib. 332,541, 1-19-93, Cl. D6-503.000.
Yamaguchi, Seiji: *See*—
Kohama, Mitsuyoshi; Kyogoku, Nobuyuki; and Yamaguchi, Seiji, 332,588, Cl. D12-110.000.
Yamazaki, Akira, to Sony Corporation. Speaker box with built in amplifier. 332,607, 1-19-93, Cl. D14-210.000.
Yoshida, Kazuo, to Oki Electric Industry Co., Ltd. Printer. 332,622, 1-19-93, Cl. D18-55.000.
Zimmer, Inc.: *See*—
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LIST OF PLANT PATENTEES

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Dehan, Klara, 8,111, Cl. 87.600.
Dehan, Klara, 8,112, Cl. 87.600.
Dehan, Klara, to Danziger - "Dan" Flower Farm. Impatiens plant named Waltz. 8,109, 1-19-93, Cl. 87.600.
Dehan, Klara, to Danziger - "Dan" Flower Farm. Impatiens plant named Samba. 8,110, 1-19-93, Cl. 87.600.
Dehan, Klara, to Danziger - "Dan" Flower Farm. Impatiens plant named Rondo. 8,111, 1-19-93, Cl. 87.600.
Dehan, Klara, to Danziger - "Dan" Flower Farm. Impatiens plant named Flamenco. 8,112, 1-19-93, Cl. 87.600.
Fides Beheer B.V.: *See*—
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ver der Knapp, Jacques C. M., 8,107, Cl. 82.100.
Ilsink, Peter, to Bear Creek Gardens, Inc. Rose plant Interprince. 8,102, 1-19-93, Cl. 23.000.
Jessel, Walter H., Jr., to California Florida Plant Co., L.P. Carnation plant named CFPC Majestic. 8,104, 1-19-93, Cl. 70.500.
VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Conga. 8,105, 1-19-93, Cl. 74.100.
VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Mambo. 8,108, 1-19-93, Cl. 82.300.
VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Cumbia. 8,113, 1-19-93, Cl. 74.100.
van der Knapp, Jacques C. M., to Fides Beheer B.V. Chrysanthemum plant 13 Funshine cultivar. 8,106, 1-19-93, Cl. 76.000.
ver der Knapp, Jacques C. M., to Fides Beheer B.V. Chrysanthemum plant—Giraffe cultivar. 8,107, 1-19-93, Cl. 82.100.
Wong, Henry G. Plum tree named 'Compact Friar'. 8,103, 1-19-93, Cl. 38.100.
Yoder Brothers, Inc.: *See*—
VandenBerg, Cornelis P., 8,105, Cl. 74.100.
VandenBerg, Cornelis P., 8,108, Cl. 82.300.
VandenBerg, Cornelis P., 8,113, Cl. 74.100.

CLASSIFICATION OF PATENTS

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12.2 R 5,180,040
53 5,180,041

CLASS 192

56 R 5,180,042
70.2 5,180,043
106.1 5,180,044

CLASS 194

212 5,180,045
319 5,180,046

CLASS 198

335 5,180,047
619 5,180,048
699.1 5,180,049

CLASS 200

61.45 M 5,180,892
329 5,180,050
400 5,180,051

CLASS 202

32 5,180,363

CLASS 203

84 5,180,474

CLASS 204

180.1 5,180,475
192.29 5,180,476
298.05 5,180,477
298.09 5,180,478
299 R 5,180,479
5,180,480
416 5,180,481

CLASS 205

224 5,180,482

CLASS 206

45.11 5,180,052
63.3 5,180,053
140 5,180,054
256 5,180,055
5,180,056
279 5,180,057
309 5,180,058
440 5,180,059
522 5,180,060
524 B1 4,193,499
570 5,180,061
574 5,180,062
582 5,180,063
598 5,180,064

CLASS 208

28 5,180,483
189 5,180,484
254 R 5,180,485

CLASS 209

577 5,180,065

CLASS 210

195.1 5,180,486
198.2 5,180,487
232 5,180,488
238 5,180,489
239 5,180,490
282 5,180,491
490 5,180,492
512.3 5,180,493
603 5,180,494
605 5,180,495
654 5,180,496
665 5,180,497
697 5,180,498
706 5,180,499
721 5,180,500
747 5,180,501
748 5,180,502
758 5,180,503
767 5,180,504
771 5,180,505

CLASS 211

74 5,180,066
119 5,180,067
151 5,180,069
191 5,180,068

CLASS 212

218 5,180,070

CLASS 215

11.1 5,180,071
209 5,180,072
261 5,180,073

CLASS 219

10.43 5,180,893
10.55 A 5,180,896
10.55 E 5,180,894
10.55 F 5,180,895
388 5,180,898
469 5,180,899
517 5,180,900
521 B1 4,529,868

CLASS 220

3.8 5,180,074
403 5,180,075
420 5,180,076
444 5,180,077
665 5,180,078
705 5,180,079

CLASS 222

1 5,180,080
23 5,180,081
145 5,180,082
185 5,180,083
192 5,180,084
211 5,180,085

CLASS 223

66 5,180,086

CLASS 224

42.42 5,180,088
42.45 R 5,180,089
274 5,180,087

CLASS 225

42 5,180,090

CLASS 227

8 5,180,091
180 5,180,092

CLASS 228

1.1 5,180,093
4.5 5,180,094
17.7 5,180,095
180.1 5,180,096
180.2 5,180,097
183 5,180,098
263.14 5,180,099

CLASS 229

198.2 5,180,100

CLASS 232

34 5,180,101

CLASS 235

380 5,180,901
5,180,902
449 5,180,903
470 5,180,904
483 5,180,905
487 5,180,906

CLASS 236

49.3 5,180,102

CLASS 239

1 5,180,103
8 5,180,104
14.2 5,180,105
5,180,106
35 5,180,107
172 5,180,108
346 5,180,109
566 5,180,110
590 5,180,111
685 5,180,112

CLASS 241

20 5,181,029
79.1 5,180,113
169.1 5,180,114

CLASS 242

56.9 5,180,115
71.8 5,180,116
189 5,180,117
199 5,180,118

CLASS 244

10 5,180,119
118.6 5,180,120
129.5 5,180,121
134 F 5,180,122
155 A 5,180,123

CLASS 248

74.4 5,180,124
99 5,180,125
5,180,126
188.3 5,180,127
220.4 5,180,128
230 5,180,129
251 5,180,130
352 5,180,131
362 5,180,132
452 5,180,133
544 5,180,134
5,180,135
576 5,180,136

CLASS 249

197 5,180,506

CLASS 250

205 5,180,907
214 VT 5,180,908
216 5,180,909
221 5,180,910
227.21 5,180,911
234 5,180,912
281 5,180,913
287 5,180,914
327.2 5,180,915
367 5,180,916
374 5,180,917
492.2 5,180,918
5,180,919
5,180,920
554 5,180,921
561 5,180,922

CLASS 251

1.3 5,180,137
30.05 5,180,138
127 5,180,139
291 5,180,140

CLASS 252

8.8 5,180,508
22 5,180,509
47 5,180,510
61 5,180,511
62.51 5,180,512
62.55 5,180,513
99 5,180,514
135 5,180,515
186.1 5,180,516
186.27 5,180,517
188.28 5,180,518
299.61 5,180,520
5,180,521
299.63 5,180,519
311 5,180,522
512 5,180,523
586 5,180,524
609 5,180,525
631 5,180,526
638 5,180,527

CLASS 254

131 5,180,141
132 5,180,142

CLASS 256

24 5,180,143

CLASS 257

18 5,181,086
94 5,181,084
5,181,085
5,181,087
223 5,181,093
299 5,181,089
331 5,181,088
344 5,181,090
355 5,181,091
361 5,181,092
370 5,181,095
372 5,181,094
491 5,181,083
530 5,181,096
788 5,181,097

CLASS 261

111 5,180,528

CLASS 264

29.6 5,180,529
40.5 5,180,530
45.3 5,180,531
60 5,180,532
65 5,180,533
145 5,180,534
328.16 5,180,535

CLASS 266

44 5,180,536
45 5,180,537
91 5,180,538
202 5,180,539

CLASS 267

64.19 5,180,144
64.24 5,180,145
64.27 5,180,146
136 5,180,147
140.14 5,180,148
180 5,180,149

CLASS 269

254 R 5,180,150

CLASS 270

45 5,180,151
53 5,180,152
5,180,153

CLASS 271

2 5,180,154
21 5,180,155
103 5,180,156
256 5,180,157
293 5,180,158
302 5,180,159
315 5,180,160

CLASS 273

34 R 5,180,162
72 R 5,180,163
84 R 5,180,164
165 5,180,165
167 F 5,180,166
181 F 5,180,167
187 R 5,180,168
189 A 5,180,169
343 5,180,170
428 5,180,171

CLASS 277

27 5,180,172
96.1 5,180,173

CLASS 279

6 5,180,174
147 5,180,175

CLASS 280

11.28 5,180,176
47.15 5,180,177
47.315 5,180,179
47.34 5,180,178
96 5,180,180
304.1 5,180,181
477 5,180,182
629 5,180,183
646 5,180,184
704 5,180,185
714 5,180,186
732 5,180,187
740 5,180,188
779 5,180,189
838 5,180,190

CLASS 281

45 5,180,191

CLASS 283

101 5,180,192

CLASS 285

55 5,180,193
166 5,180,194
231 5,180,195
253 5,180,196
351 5,180,197

CLASS 290

40 C 5,180,923

CLASS 292

201 5,180,198
259 5,180,199
326 5,180,200
336.3 5,180,201

CLASS 296

97.9 5,180,202
98 5,180,203
146 C 5,180,204
181 5,180,205
204 5,180,206

CLASS 297

408 5,180,207
440 5,180,208

CLASS 299

41 5,180,209
70 5,180,210

CLASS 303

9.63 5,180,211
9.68 5,180,212
86 5,180,213
111 5,180,214
113.2 5,180,215
5,180,216

CLASS 307

10.6 5,180,924
114 5,180,925
272.3 5,180,926
5,180,927
296.6 5,180,928
348 5,180,936
350 5,180,929
353 5,180,930
5,180,931
5,180,932
475 B1 5,027,014
514 5,180,933
518 5,180,934
524 5,180,935
602 5,180,937
605 5,180,938

CLASS 310

27 5,180,939
40 MM 5,180,940
323 5,180,941
346 5,180,942

CLASS 312

334.7 5,180,217

CLASS 313

535 5,180,943

CLASS 315

5 5,180,944
14 5,180,945
39.51 5,180,946
85 5,180,947
111.21 5,180,948
111.51 5,180,949
127 5,180,950
169.3 5,180,951
210 5,180,952
241 S 5,180,953

CLASS 316

140 R 5,181,049

CLASS 318

369 5,180,954
568.10 5,180,955
568.11 5,180,956
578 5,180,957
623 5,180,958
626 5,180,959
701 5,180,960

CLASS 320

20 5,180,961
35 5,180,962

CLASS 323

211 5,180,963
222 5,180,964
275 5,180,965
308 5,180,966
315 5,180,967

CLASS 324

71.1 5,180,968
71.2 5,180,969
117 H 5,180,970
121 R 5,180,971
127 5,180,972
130 5,180,973
158 F 5,180,974
5,180,975
5,180,976
158 P 5,180,977
207.16 5,180,978
207.18 5,180,979
229 5,180,980
309 5,180,981
322 5,180,982
399 5,180,983
5,180,984
613 5,180,985
660 5,180,986

CLASS 328

14 5,180,987

CLASS 330

282 5,180,988
295 5,180,989
304 5,180,990

CLASS 331

1 A 5,180,991
11 5,180,992
16 5,180,993
38 5,180,994
57 5,180,995
77 5,180,996

CLASS 333

24.2 5,180,997
164 5,180,998
175 5,180,999
181 5,181,000

CLASS 335

14 5,181,001
131 5,181,002
282 5,181,003

CLASS 336

198 5,181,004

CLASS 337

354 5,181,005

CLASS 338

22 R 5,181,006
5,181,007
28 5,181,008

CLASS 340

407 5,181,009
426 5,181,010
438 5,181,011
461 5,181,012
474 5,181,019
551 5,181,020
572 5,181,021
616 5,181,022
702 5,181,013
703 5,181,014
706 5,181,015
788 5,181,016
825.02 5,181,017
825.31 5,181,018
825.46 5,181,023
825.690 5,181,024
870.21 5,181,025
870.28 5,181,026
961 5,181,027
974 5,181,028

CLASS 341

20 5,181,030
65 5,181,031
143 5,181,032
5,181,033
144 5,181,034
161 5,181,035

CLASS 342

15 5,181,036
70 5,181,037
5,181,038
119 5,181,039
149 5,181,040
453 5,181,041

CLASS 343

700 MS 5,181,042
713 5,181,043
752 5,181,044

CLASS 346

1.1 5,181,045
76 PH 5,181,046
5,181,047
5,181,048
155 5,181,050

CLASS 351

52 5,181,051
156 5,181,052
161 5,181,053

CLASS 353

20 5,181,054

CLASS 354

62 5,181,055
70 5,181,056
94 5,181,057
105 5,181,058
108 5,181,059
238.1 5,181,060
400 5,181,061
412 5,181,062
435 5,181,063
437 5,181,064
485 5,181,065

CLASS 355

29 5,181,066
43 5,181,067
77 5,181,068
133 5,181,069
200 5,181,070
203 5,181,071
225 5,181,072
243 5,181,073
245 5,181,074
259 5,181,075
315 5,181,076

CLASS 356

307 5,181,077
350 5,181,078
375 5,181,079
381 5,181,080
394 5,181,081
436 5,181,082

CLASS 358

10 5,181,098
21 R 5,181,099
37 5,181,100
41 5,181,101
56 5,181,102
64 5,181,103

75 5,181,104
80 5,181,105
86 5,181,106
5,181,107
93 5,181,108
105 5,181,109
140 5,181,110
5,181,111
141 5,181,112
142 5,181,113
146 5,181,114
158 5,181,115
159 5,181,116
169 5,181,117
213.16 5,181,118
227 5,181,119
229 5,181,120
236 5,181,121
238 5,181,122
246 5,181,123
300 5,181,124
336 5,181,125
426 5,181,126
443 5,181,127
486 5,181,128
494 5,181,129

CLASS 359

42 5,181,130
56 5,181,131
58 5,181,132
84 5,181,133
117 5,181,134
141 5,181,135
190 5,181,136
217 5,181,137
239 5,181,138
408 5,181,139
507 5,181,140
580 5,181,141
581 5,181,142
586 5,181,143
700 5,181,144
859 5,181,145

CLASS 360

19.1 5,181,146
31 5,181,147
99.080 5,181,148
119 5,181,149
121 5,181,150
126 5,181,151
5,181,152
132 5,181,153

CLASS 361

17 5,181,154
93 Re.34,163
94 5,181,155
283 5,181,156
321 5,181,157
335 5,181,158
345 5,181,164
355 5,181,165
364 5,181,166
385 5,181,167
427 5,181,168

CLASS 362

61 5,180,218
5,180,219
98 5,180,220
101 5,180,221
125 5,180,222
223 5,180,223
255 5,180,224

CLASS 363

17 5,181,169
21 5,181,170
89 5,181,159
97 5,181,160

CLASS 364

287 5,181,186
419 5,181,162
5,181,163
421 5,181,171
422 5,181,172
424.05 5,181,173
426.02 5,181,174
426.03 5,181,175
470 5,181,176
474.04 5,181,177
474.11 5,181,178
488 5,181,179
492 5,181,180
566 5,181,181
718 5,181,182
725 5,181,183
738 5,181,184
760 5,181,185

CLASS 365

182 5,181,187
228 5,181,188

CLASS 366

147 5,180,225

CLASS 368

10 5,181,189
76 5,181,190
113 5,181,191
282 5,181,192

CLASS 369

44.23 5,181,193
44.25 5,181,194
44.41 5,181,195
48 5,181,161
5,181,196
75.1 5,181,197

CLASS 370

32.1 5,181,198
60 5,181,199
85.1 5,181,200
5,181,201
85.15 5,181,202

CLASS 371

15.1 5,181,203
16.5 5,181,204
21.1 5,181,205
21.5 5,181,206
37.4 5,181,207
40.1 5,181,208
43 5,181,209

CLASS 372

6 5,181,210
21 5,181,211
22 5,181,212
30 5,181,213
34 5,181,214
5,181,215
36 5,181,216
38 5,181,217
45 5,181,218
5,181,219
5,181,220
46 5,181,221
53 5,181,222
69 5,181,223
101 5,181,224

CLASS 374

127 5,180,226
131 5,180,227
139 5,180,228

CLASS 375

1 5,181,225
5,181,226
95 5,181,227
103 5,181,228
114 5,181,229

CLASS 376

261 5,180,540
271 5,180,541
272 5,180,542
282 5,180,543
333 5,180,544
352 5,180,545
371 5,180,546
377 5,180,547
439 5,180,548
445 5,180,549
449 5,180,550

CLASS 377

26 5,181,231
30 5,181,232

CLASS 378

79 5,181,233
87 5,181,234
133 5,181,235

CLASS 379

67 5,181,236
88 5,181,237
95 5,181,238
96 5,181,239
98 5,181,240
107 5,181,241
445 5,181,242

CLASS 380

6 5,181,243
23 5,181,245
34 5,181,246

CLASS 381

24 5,181,247
25 5,181,248
27 5,181,249
51 5,181,250
96 5,181,251
187 5,181,252
199 5,181,253

CLASS 382

1 5,181,254
9 5,181,255
14 5,181,256
17 5,181,257
28 5,181,258
36 5,181,259
46 5,181,260
48 5,181,261

CLASS 383

91 5,180,229

CLASS 384

54 5,180,230
527 5,180,231

CLASS 385

16 5,181,262
24 5,181,263
33 5,181,264
5,181,265
78 5,181,266
86 5,181,267
128 5,181,268
5,181,269
134 5,181,270
135 5,181,271
139 5,181,272

CLASS 395

161 5,181,273

CLASS 400

88 5,180,232
120 5,180,233
124 5,180,234
167 5,180,235
175 5,180,236
247 5,180,238
479 5,180,237

CLASS 401

6 5,180,239
88 5,180,240
122 5,180,241
132 5,180,242
195 5,180,243
264 5,180,244
278 5,180,245

CLASS 402

20 5,180,246
41 5,180,247

CLASS 403

13 5,180,248
28 5,180,249
252 5,180,250

CLASS 404

49 5,180,575

CLASS 405

129 5,180,251
144 5,180,252
146 5,180,253
155 5,180,254
270 5,180,255
282 5,180,256

CLASS 406

173 5,180,257

CLASS 407

114 5,180,258

CLASS 408

124 5,180,259
211 5,180,260
239 R 5,180,261

CLASS 410

12 5,180,262
106 5,180,263

CLASS 411

32 5,180,264
150 5,180,265
369 5,180,270
429 5,180,266
432 5,180,267
536 5,180,268

CLASS 414

24.5 5,180,271
313 5,180,272
331 5,180,269
404 5,180,273
427 5,180,274
541 5,180,275
752 5,180,276
792.7 5,180,277

CLASS 415

27 5,180,278
177 5,180,279
206 5,180,280
209.2 5,180,281
5,180,282

CLASS 416

204 R 5,180,284
220 A 5,180,286
241 B 5,180,285

CLASS 417

43 5,180,287
48 5,180,288
53 5,180,289
218 5,180,290
234 5,180,283
273 5,180,291
5,180,292
366 5,180,293
516 5,180,294

CLASS 418

55.3 5,180,295
61.3 5,180,296
104 5,180,297
181 5,180,298
190 5,180,299

CLASS 420

511 5,180,551

CLASS 422

1 5,180,552
28 5,180,553
86 5,180,554
102 5,180,555
109 5,180,556
131 5,180,558
139 5,180,557
168 5,180,559
189 5,180,560
191 5,180,561
429 5,180,562

CLASS 423

21.5 5,180,563
115 Re.34,164
235 5,180,565
238 5,180,566
239 5,180,567
248 5,180,568
309 5,180,564
319 5,180,569
359 5,180,570
446 5,180,571
576.7 5,180,572
584 5,180,573
594 5,180,574

CLASS 424

52 5,180,576
5,180,577
70 5,180,579
71 5,180,580
93 A 5,180,581
94.4 5,180,582
94.64 5,180,583
401 5,180,584
405 5,180,585
5,180,586
408 5,180,587
439 5,180,588
465 5,180,589
466 5,180,590
473 5,180,591

CLASS 425

46 5,180,592
202 5,180,593
547 5,180,594
556 5,180,595

CLASS 426

36 5,180,596
52 5,180,597
88 5,180,598
106 5,180,599
233 5,180,600
242 5,180,601
515 5,180,602
556 5,180,603
582 5,180,604

CLASS 427

2 5,180,605
5,180,606
8 5,180,607
64 5,180,610
96 5,180,611
372.2 5,180,612
560 5,180,608
595 5,180,609

CLASS 428

34.2 5,180,614
35.3 5,180,615
64 5,180,616
71 5,180,617
100 5,180,618
116 5,180,619
138 5,180,620
5,180,621
192 5,180,622
209 5,180,623
211 5,180,624
212 5,180,625
213 5,180,626
214 5,180,627
215 5,180,628
220 5,180,629
224 5,180,630
236 5,180,631
253 5,180,632
300 5,180,633
336 5,180,634
345 5,180,635
373 5,180,636
402.21 5,180,637
407 5,180,638
412 5,180,639
611 5,180,640

CLASS 429

1 5,180,641
90 5,180,642
91 5,180,643
98 5,180,644
127 5,180,645
198 5,180,646
252 5,180,647

CLASS 430

21 5,180,648
106.6 5,180,649
5,180,650
138 5,180,651
281 5,180,652
296 5,180,653
309 5,180,654
327 5,180,655
393 5,180,656
503 5,180,657
533 5,180,658
623 5,180,659

CLASS 431

115 5,180,300
116 5,180,301
348 5,180,302

CLASS 433

173 5,180,303
224 5,180,304

CLASS 434

102 5,180,305
129 5,180,306
157 5,180,307
262 5,180,308
323 5,180,309

CLASS 435

5 5,180,660
7.21 5,180,661
7.24 5,180,662
7.4 5,180,663
7.92 5,180,664
21 5,180,665
29 5,180,666
69.2 5,180,667
5,180,668
99 5,180,669
119 5,180,670
136 5,180,671
190 5,180,672
199 5,180,673
235.1 5,180,675
240.1 5,180,676
288 5,180,674

CLASS 436

17 5,180,677
501 5,180,678
518 5,180,679

CLASS 437

38 5,180,680
40 5,180,681
44 5,180,682
47 5,180,683
110 5,180,684
129 5,180,685
181 5,180,686
187 5,180,687
195 5,180,688
228 5,180,689
233 5,180,690
235 5,180,691
240 5,180,692

CLASS 439

34 5,180,310
74 5,180,311
78 5,180,312
125 5,180,313
394 5,180,314
581 5,180,315
610 5,180,316
669 5,180,317
716 5,180,318

CLASS 440

52 5,180,319
61 5,180,320

CLASS 441

94 5,180,321

CLASS 445

37 5,180,322

CLASS 446

120 5,180,323
296 5,180,324
385 5,180,325

CLASS 450

91 5,180,326

CLASS 452

47 5,180,327
128 5,180,328
166 5,180,329

CLASS 454

64 5,180,330
187 5,180,331
230 5,180,332
319 5,180,333

CLASS 464

35 5,180,334
68 5,180,335
102 5,180,336

CLASS 472

57 5,180,337
96 5,180,338

CLASS 474

28 5,180,339
52 5,180,578
111 5,180,340
5,180,341
123 5,180,342
144 5,180,343
148 5,180,344
201 5,180,345

CLASS 475

200 5,180,346

CLASS 476

51 5,179,865

CLASS 482

5 5,180,347
6 5,180,348
34 5,180,349
40 5,180,350
52 5,180,351
108 5,180,352
111 5,180,353
133 5,180,354
143 5,180,161

CLASS 493

315 5,180,355
316 5,180,356
420 5,180,357

CLASS 494

48 5,180,358

CLASS 501

12 5,180,693
5,180,694
66 5,180,695
87 5,180,696
96 5,180,697
132 5,180,698
134 5,180,699

CLASS 502

50 5,180,700
64 5,180,701
107 5,180,702
243 5,180,703
402 5,180,704

CLASS 503

227 5,180,705

CLASS 504

116 5,180,420
136 5,180,416
193 5,180,418
206 5,180,414
246 5,180,417
276 5,180,419
299 5,180,415

CLASS 505

1 5,180,706
5,180,707
5,180,708

CLASS 512

17 5,180,709
26 5,180,710

CLASS 514

15 5,180,711
16 5,180,712
17 Re.34,165
31 5,180,713
46 5,180,714
54 5,180,715
58 5,180,716
63 5,180,717
183 5,180,718
192 5,180,719
211 5,180,720
213 5,180,721
219 5,180,722
234.2 5,180,723
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252 5,180,726
255 5,180,727
267 5,180,728
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364 5,180,731
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426 5,180,734
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454 5,180,736
463 5,180,737
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491 5,180,739
516 5,180,740
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558 5,180,742
565 5,180,743
616 5,180,744
618 5,180,745
654 5,180,746
681 5,180,747
691 5,180,748
726 5,180,749

CLASS 521

32 5,180,750
51 5,180,751
57 5,180,752
65 5,180,753
85 5,180,754
116 5,180,755

CLASS 522

35 5,180,756
76 5,180,757
244 5,180,841

CLASS 523

141 5,180,759
169 5,180,760
213 5,180,761

CLASS 524

100 5,180,762
112 5,180,763
260 5,180,764
306 5,180,765
315 5,180,766
411 5,180,767
420 5,180,768
525 5,180,769
563 5,180,770
588 5,180,771
816 5,180,772
853 5,180,773

CLASS 525

54.44 5,180,774
64 5,180,775
5,180,776
66 5,180,777
74 5,180,778
87 5,180,779
96 5,180,780
148 5,180,781
183 5,180,782
198 5,180,783
207 5,180,784
240 5,180,785
281 5,180,786
282 5,180,787
285 5,180,788
326.3 5,180,789
329.6 5,180,790
358 5,180,791
423 5,180,792
446 5,180,793
487 5,180,794
504 5,180,795
537 5,180,796
539 5,180,797

CLASS 526

66 5,180,798
177 5,180,799

CLASS 527

300 5,180,800

CLASS 528

15 5,180,801
335 5,180,802
488 5,180,803
500 5,180,804

CLASS 530

324 5,180,805
326 5,180,806
345 5,180,807
350 5,180,808
5,180,809
5,180,810
351 5,180,811
5,180,812
388.3 5,180,813
388.8 5,180,814
404 5,180,815
5,180,816

CLASS 534

811 5,180,817

CLASS 536

23.1 5,180,818
23.2 5,180,819
23.51 5,180,820

CLASS 540

465 5,180,821

CLASS 544

212 5,180,823
251 5,180,824
318 5,180,825
332 5,180,826

CLASS 546

14 5,180,827
37 5,180,828
188 5,180,829
222 5,180,830
278 5,180,822
291 5,180,831
333 5,180,832

CLASS 548

202 5,180,833
241 5,180,834
302.7 5,180,836
303.4 5,180,835
315.4 5,180,837

CLASS 549

59 5,180,838
316 5,180,839
348 5,180,840

CLASS 552

201 5,180,758
293 5,180,842

CLASS 556

77 5,180,843
436 5,180,844
445 5,180,845

CLASS 560

238 5,180,847

CLASS 562

17 5,180,846
405 5,180,848
414 5,180,849
606 5,180,850

CLASS 564

134 5,180,851

CLASS 568

57 5,180,852
305 5,180,853
454 5,180,854
486 5,180,855
617 5,180,856
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885 5,180,858
946 5,180,859

CLASS 570

157 5,180,860
160 5,180,861
202 5,180,862

CLASS 585

7 5,180,863
10 5,180,864
5,180,865
5,180,866
22 5,180,867
240 5,180,868
255 5,180,869
277 5,180,870
400 5,180,871
435 5,180,872

CLASS 602

6 5,180,359
18 5,180,361
74 5,180,360

CLASS 604

8 5,180,362
53 5,180,364
93 5,180,365
96 5,180,366
101 5,180,367
104 5,180,368
110 5,180,369
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118 5,180,371
161 5,180,372
167 5,180,373
192 5,180,374
264 5,180,375
266 5,180,387
282 5,180,376
342 5,180,377

CLASS 606

10 5,180,378
32 5,180,379
54 5,180,380
61 5,180,381
65 5,180,382
72 5,180,383
80 5,180,384
224 5,180,385
240 5,180,386

CLASS 623

6 5,180,389
5,180,390
10 5,180,391
11 5,180,392
13 5,180,393
16 5,180,388
18 5,180,394
23 5,180,395

CLASS 800

205 5,180,873

D2—	184	332,514		545	332,543		456	332,571			332,600		77	332,630			332,658
	270	332,515			332,544		520	332,572			332,601		78	332,631		126	332,659
	290	332,516		596	332,545	D10—	46.2	332,579		154	332,602		90	332,632		145	332,660
		332,517		601	332,546		74	332,573		184	332,603	D21—	13	332,633		164	332,662
		332,518	D7—	300.2	332,547		78	332,574	D14—	100	332,604		20	332,634		169	332,661
	314	332,519			332,548			332,575		106	332,605		27	332,635		190	332,663
		332,520		360	332,549		98	332,576		118	332,606		31	332,636		227	332,664
		332,521		619	332,550		101	332,577		210	332,607		51	332,637	D25—	1	332,665
		332,522			332,551		109	332,578		226	332,608		61	332,638		48	332,666
	320	332,523			332,552	D11—	12	332,580		234	332,609		81	332,639		68	332,667
D3—	30.1	332,524		637	332,553		121	332,581		252	332,610		108	332,640	D26—	11	332,668
	34	332,525		685	332,554		130.1	332,582	D15—	1	332,611			332,641		63	332,669
	38	332,526	D8—	1	332,619		149	332,583		5	332,612			332,642	D28—	38	332,670
	40	332,527		10	332,555		164	332,584		9	332,613			332,643	D29—	10	332,671
D6—	301	332,528		14.1	332,556		201	332,585		78	332,614			332,644		15	332,672
	333	332,529		29	332,557	D12—	6	332,586		122	332,615			332,645	D30—	120	332,673
	370	332,530		62	332,558		91	332,587	D16—	131	332,616		121	332,646		122	332,674
	379	332,531			332,559		110	332,588	D18—	1	332,617		191	332,647		162	332,675
	385	332,532			332,560		114	332,589			332,618		232	332,648	D34—	1	332,676
	446	332,533		69	332,561		129	332,590		7	332,620	D22—	122	332,649			332,677
	469	332,534		73	332,562			332,591		52	332,623			332,650			332,678
	482	332,535		303	332,563			332,592		55	332,621		149	332,651		6	332,679
		332,536		314	332,564		155	332,593			332,622	D23—	226	332,652		7	332,680
		332,537		354	332,565		157	332,594	D19—	43	332,624		262	332,653			332,681
		332,538		368	332,566		162	332,595		44	332,625		308	332,654		21	332,682
	495	332,539		396	332,567		193	332,596		48	332,626		378	332,655		45	332,683
	502	332,540		397	332,568	D13—	133	332,597		49	332,627	D24—	111	332,656	D99—	34	332,684
	503	332,541	D9—	418	332,569		147	332,598		65	332,628		117	332,657		36	332,685
	518	332,542		434	332,570			332,599		69	332,629						

CLASSIFICATION OF PLANTS

P.—	23	8,102		70.5	8,104			8,113		82.1	8,107		87.6	8,109			8,111
	38.1	8,103		74.1	8,105		76	8,106		82.3	8,108			8,110			8,112

GEOGRAPHICAL INDEX

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PATENTS

01 : 5,179,746	5,180,131	5,180,661	5,181,228	5,179,798	5,179,896
5,180,036	5,180,158	5,180,713	5,181,234	5,179,832	5,179,898
5,180,381	5,180,163	5,180,715	5,181,239	5,179,940	5,179,930
02 : 5,180,380	5,180,165	5,180,716	5,181,255	5,179,961	5,179,952
04 : 5,179,766	5,180,166	5,180,721	5,181,270	5,179,984	5,179,969
5,179,877	5,180,179	5,180,807	4,193,499	5,179,992	5,179,978
5,179,919	5,180,201	5,180,808	4,529,868	5,180,062	5,180,035
5,180,177	5,180,220	5,180,809	08 : 5,179,773	5,180,168	5,180,060
5,180,205	5,180,223	5,180,824	5,179,821	5,180,232	5,180,090
5,180,428	5,180,224	5,180,828	5,179,868	5,180,248	5,180,134
5,180,557	5,180,230	5,180,840	5,180,057	5,180,263	5,180,175
5,180,757	5,180,265	5,180,873	5,180,104	5,180,281	5,180,246
5,180,885	5,180,268	5,180,876	5,180,277	5,180,284	5,180,255
5,180,935	5,180,287	5,180,926	5,180,328	5,180,309	5,180,317
5,180,951	5,180,289	5,180,930	5,180,520	5,180,385	5,180,320
5,180,986	5,180,299	5,180,932	5,180,572	5,180,552	5,180,366
5,180,988	5,180,303	5,180,936	5,180,818	5,180,569	5,180,407
5,181,041	5,180,304	5,180,937	5,180,874	5,180,644	5,180,421
5,181,156	5,180,311	5,180,944	5,180,971	5,180,645	5,180,444
5,181,243	5,180,316	5,180,964	09 : 5,179,851	5,180,774	5,180,484
05 : 5,180,437	5,180,337	5,180,976	5,179,957	5,180,891	5,180,504
06 : 5,179,738	5,180,359	5,180,977	5,179,968	5,180,896	5,180,594
5,179,741	5,180,364	5,180,994	5,180,047	5,180,911	5,180,604
5,179,767	5,180,368	5,181,006	5,180,101	5,180,923	5,180,643
5,179,770	5,180,374	5,181,008	5,180,150	5,181,052	5,180,669
5,179,791	5,180,415	5,181,010	5,180,151	5,181,107	5,180,720
5,179,792	5,180,417	5,181,015	5,180,153	5,181,138	5,180,725
5,179,807	5,180,432	5,181,017	5,180,154	5,181,139	5,180,733
5,179,824	5,180,441	5,181,026	5,180,157	5,181,181	5,180,744
5,179,825	5,180,442	5,181,029	5,180,159	5,181,207	5,180,925
5,179,831	5,180,467	5,181,031	5,180,225	5,181,227	5,180,942
5,179,839	5,180,470	5,181,038	5,180,278	5,181,233	5,180,950
5,179,847	5,180,475	5,181,043	5,180,338	13 : 5,179,749	5,180,952
5,179,872	5,180,478	5,181,049	5,180,357	5,179,781	5,180,959
5,179,880	5,180,479	5,181,050	5,180,373	5,179,811	5,180,970
5,179,886	5,180,493	5,181,080	5,180,413	5,179,970	5,180,972
5,179,893	5,180,499	5,181,096	5,180,427	5,180,068	5,180,978
5,179,914	5,180,503	5,181,100	5,180,829	5,180,082	5,181,069
5,179,936	5,180,514	5,181,108	5,180,835	5,180,169	5,181,112
5,179,938	5,180,517	5,181,130	5,181,172	5,180,195	5,181,236
5,179,939	5,180,531	5,181,133	5,181,200	5,180,286	5,181,237
5,179,942	5,180,546	5,181,143	10 : 5,180,293	5,180,511	5,181,250
5,179,955	5,180,547	5,181,148	5,180,585	5,180,581	5,181,263
5,179,975	5,180,565	5,181,167	5,180,697	5,180,831	8,298,986
5,179,983	5,180,591	5,181,187	5,180,729	5,180,843	18 : 5,179,743
5,179,986	5,180,593	5,181,191	5,180,845	5,181,269	5,179,744
5,179,993	5,180,601	5,181,202	5,180,846	16 : 5,179,756	5,179,874
5,180,066	5,180,619	5,181,204	5,180,860	5,179,901	5,179,920
5,180,069	5,180,625	5,181,212	5,180,870	5,180,974	5,179,994
5,180,078	5,180,635	5,181,214	11 : 5,179,959	17 : 5,179,803	5,180,050
5,180,081	5,180,640	5,181,215	5,180,222	5,179,810	5,180,196
5,180,122	5,180,641	5,181,223	5,180,305	5,179,830	5,180,275
5,180,125	5,180,655	5,181,224	12 : 5,179,758	5,179,848	5,180,324

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29 : 5,179,748
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33 : 5,180,092
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34 : Re.34,165
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	332,542		332,684		332,676	31 :	332,577		332,578	45 :	332,558
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	332,596		332,660	25 :	332,520		332,625		332,591	51 :	332,524
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	332,612	13 :	332,528		332,637		332,675	42 :	332,514		332,631
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06 : 8,103	8,104	8,105	8,108	8,113	

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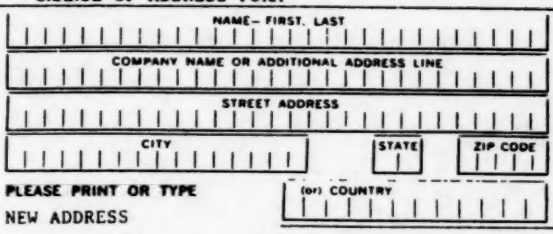

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